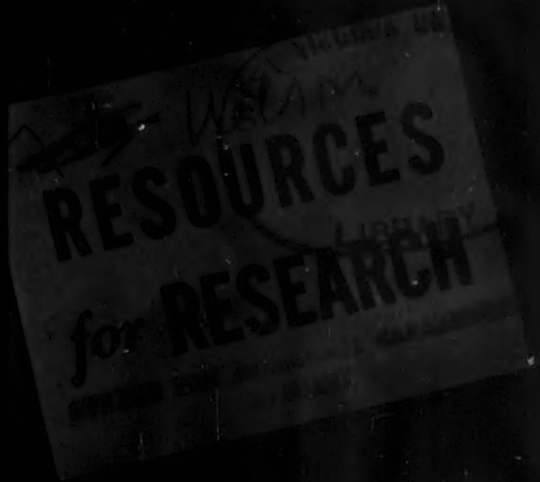
BER 24, 1940

The IRON AGE



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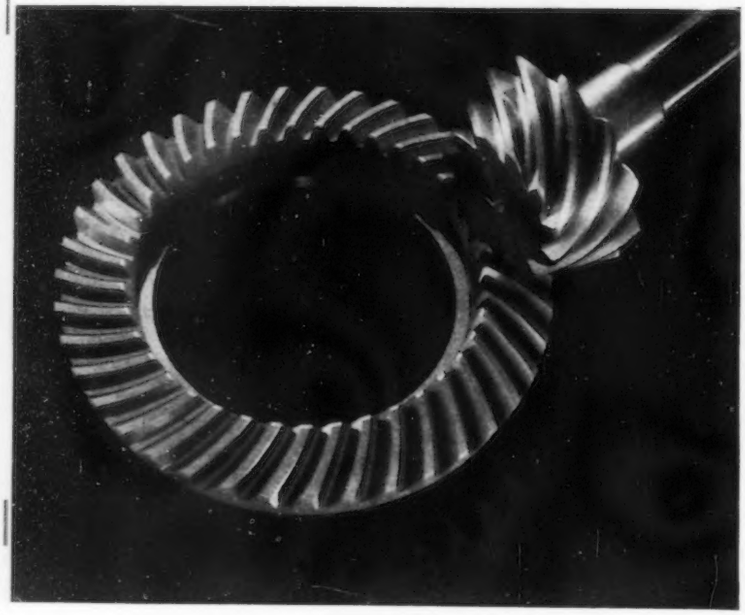

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OCTOBER 24, 1940

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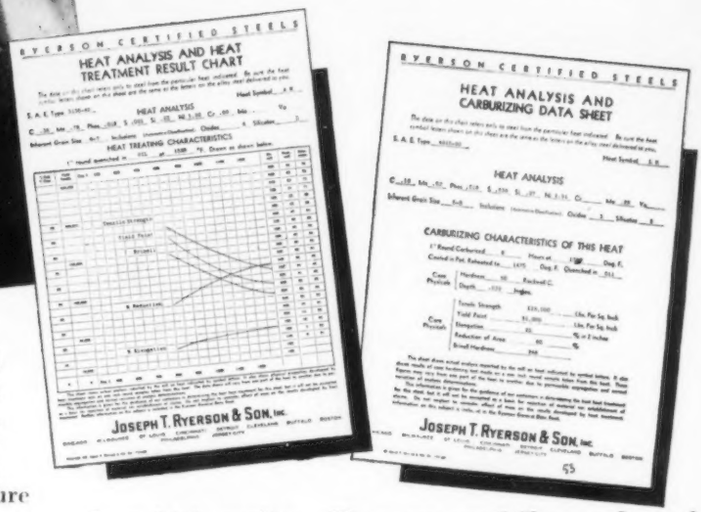
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The Iron Age

OCT. 24, 1940

ESTABLISHED 1855

Political Mechanization

BEFORE we began our armament program you heard a great deal about the evils of mechanization. It was a favorite subject for the New Dealers to use in arraying workers against employers and in casting suspicion and distrust upon the American system of private enterprise.

We do not hear the machine thus criticised today. In fact, we hear big and little industrialists criticised by Washington for not turning more and more of them out faster and faster.

In neither of these completely opposite situations, however, have we heard anything said about political mechanization!

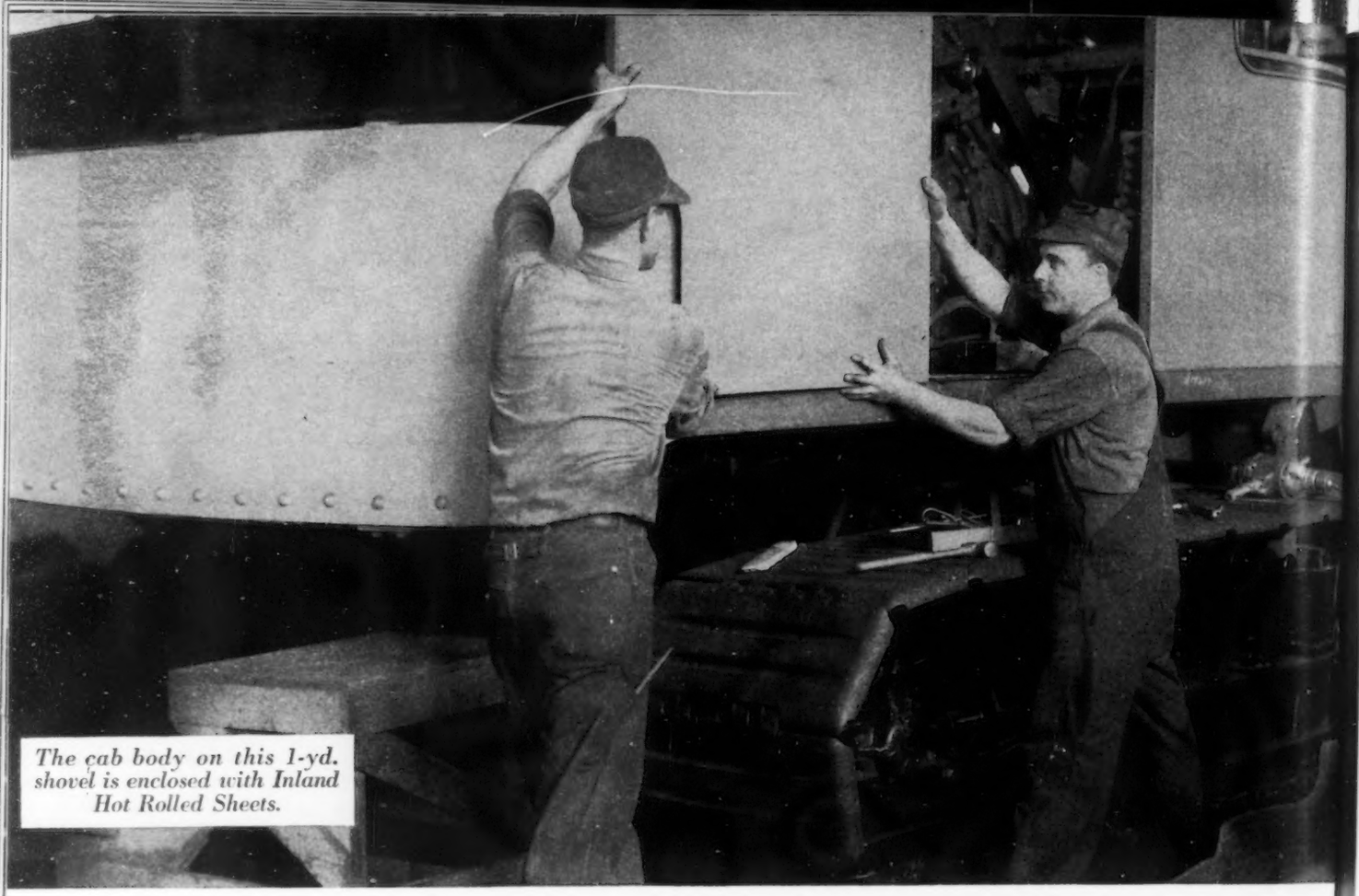
Political mechanization has nothing to do with the political organization which is a necessary step in electing a new President. The political machine does not start getting up steam until the President is elected and has taken office. During the first four years of party power it gets steam up slowly. During the second four years, the boys who have gathered around the "chief" have learned how to manipulate the gadgets, and the speed and power of the political machine become greatly multiplied. So greatly multiplied that the contender who must make his way against it is seriously handicapped, no matter how able he may be or how unable the man in power.

That was the reason for establishing a "no third term" precedent. For if this machine were given another four years of adding legislative and administrative gadgets and taking on patronage passengers, it would become an invincible juggernaut, a steam roller that would crush the life out of Democracy.

It makes no difference which or what party may be in power. Elect the same man President for three terms and you will never vote to elect another President.

You may go through the motions of voting for him, as the Germans did for Hitler, but your vote won't elect him nor will it keep him from being elected. The machine will take care of keeping him in power.

In spite of the present New Deal machine with its horde of political technicians and hangers on, Willkie is apparently getting ready to send it to the scrap heap on Nov. 5. Help him do it. We need a hand made President for this country, not a machine made one.



The cab body on this 1-yd. shovel is enclosed with Inland Hot Rolled Sheets.

THERE IS PROFIT in Selecting the Right Steel

HOW long has it been since you have looked for profits hidden by buying habits that do not keep pace with engineering design and consumer preference? Many leading manufacturers, now customers of Inland, are keeping buying habits abreast of every move made by their engineers—and they find it profitable.

A case in point is the shovel cab, shown above. This cab is now enclosed with Inland Hot Rolled Sheets. These sheets, rolled on Inland continuous mills, are true to gauge, have excellent forming qualities and a smooth, flat surface. They meet every requirement of workability and finish. This change to Inland Hot Rolled Sheets is a good example of co-ordinating engineering design, consumer preference and buying practice.

The most effective way to check buying habits is to call in an Inland engineer. If he finds ways to improve your finished products, or to reduce the cost of manufacture, you gain by his efforts. His services are yours without obligation.

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How BIG a Job is NATIONAL DEFENSE?

o o o

By CHARLES J. STILWELL
President, Warner & Swasey Co., Cleveland

o o o

IT is high time that the people of the United States awoke to a realization of the size and duration of a national defense program sufficient to guarantee the protection of the United States and the American continent.

Those who assume that by simply appropriating billions we have taken care of this problem are indulging in a day dream. In the first place, money does not mean defense until it has been turned into military supplies, equipment and training. In the second place, appropriations thus far voted will cover only a fraction of the cost of military preparedness on a scale comparable to that of England or Germany.

On the other hand, the people who complain that although several months have passed since appropriations were voted only a relatively small amount of defense equipment has actually been produced, likewise display a complete lack of understanding of the total size of the job to be done, and the methods which must be employed to achieve the final desired result in the shortest period of time.

If these critics of the present picture gave any real consideration to the matter, they would see at once that *speed today lies not in hasty and expensive production of a handful of tanks, guns and planes, but in careful and thorough planning and preparation for enormous mass production beginning in 1941 and increasing, very likely, for several years thereafter.*

One way of estimating the job we have cut out for ourselves—a method which any business would naturally employ in planning toward the future—is to survey our competition.

For over five years Germany has done nothing but prepare for war.

For over five years the activities of every German citizen have been regimented for war preparedness.

For over five years Germany's entire economic and industrial facilities have been geared up for war production.

Private freedom, initiative and ownership—the right of free speech—the collective bargaining rights of labor—all of the rights which we in this country take as a matter of course, have been destroyed in Germany in favor of the one single objective of armament.

Before the drive into Holland, Belgium and France, Germany, according to newspaper estimates, had 8,000,000 men in the active army and reserves. I have often heard it said that "it takes ten men behind the lines to back up each man in the army." With Germany's total population only 85,000,000, certainly every man, woman and child in the country, every plant, mill and factory, have for years been working for war. This is the measure of our competition.

If we are talking about *real* preparedness, we cannot play around with half measures. We must build our power of defense on a basis comparable to the power of attack against which we intend to defend ourselves. It is my firm belief that our defense program will run into at least three to four years and will involve, directly or indirectly, practically every industry and every individual in the United States.

This job of necessity is one which must be assumed and carried through by the factories and the factory employees of this country.

Government-owned production facilities are an almost negligible factor in comparison with the task to be performed. For they have never been geared up for large production. There has been no need of building up facilities in that direction. In time of peace we have always had a small army with small requirements.

In the last World War private industry picked up and carried the load of war production. And today industry again must pick up and carry the load—but this time the load will be infinitely greater than anything that was even imagined during the last war.

There is no question about the capacity of industry to accept and fulfill this responsibility—but it is by no means a simple proposition. For years our plants have been making peace time products—autos, refrigerators, vacuum cleaners, telephones. They have had no experience with production for military purposes.

While the principles of mass production utilized for peace time products can, and will, be applied to preparedness production, the changeover to defense production is difficult and complicated. A plant making trucks, for instance, cannot simply shift overnight to tanks. The making of tanks may prove to be quite a new proposi-

tion. It may involve quite different equipment and facilities. Possibly only a small share of existing facilities can be adapted to the new product.

The only safe method is to start at the beginning. A plant undertaking defense production on a volume basis must go through exactly the same steps as would be the case if that plant ventured into maximum production of a new peace time product. These steps are well defined by past experience. They are, in the main, as follow:

(1) Complete the drawings and design of the product to be made.
(2) Make a sample of this product and test it out to see whether it works satisfactorily.
(3) If it "proves out", then "tool up" the plant for volume production of the product. This means selecting, buying and installing the necessary machine tools, gages, cutting tools, and other equipment.
(4) Establish sources of materials and assemble and train sufficient men for continuous production.
(5) Then start and continue operations on a volume basis in accordance with definite, predetermined specifications, working three shifts in order to achieve the maximum production from equipment and facilities.

That is the only way in which the job can be done.

Of course if we want to be short-sighted and push too hard, we can get inconsequential results immediately at inordinate costs. A company asked to build tanks, for instance, could make a few immediately on a custom-built basis. The cost would be excessive.

But if this same company concentrated on getting productive facilities and equipment ready for a long-term, straight-line production job, properly planned, and with product specifications defined in advance, it could then, when everything was "all set," turn out tanks at the lowest cost and at the greatest possible speed.

This would mean no output at all for the time being. But for the "long pull" it would mean the largest possible output in the least possible time.

The Production Division of the National Defense Advisory Commission understands this picture. That is why they have been centering their efforts upon planning and preparation. With the cooperation of the Army and Navy on the one hand and the various branches of American industry on the other, they have been endeavoring to determine just what supplies and equipment will be needed, and in what quantity. They have been studying where and how these supplies and equipment can best be made, bearing in mind the nature, extent and location of present industrial plants and facilities. They are trying to hasten the determination of actual specifications for defense products—for unless and until those specifications are set, producers cannot tell just what equipment and facilities are going to be required.

This is exactly the sort of work which must be done today in order to insure maximum results tomorrow.

Meanwhile, through the Production Division of the Commission, industry has been given an over-all picture as to what will be expected of it so that, insofar as is possible, it may prepare itself for what is to come.

The experience of the machine tool industry is, I believe, typical in this respect. It has not yet been possible to give the industry definite schedules as to just what machine tools will be required or in what quantities. This cannot be done until specifications and quantities for various types of defense equipment have been determined. But at the same time, through the Production Division of the Commission, the machine tool industry has been given general estimates of what will be required of it, and is gearing up accordingly.

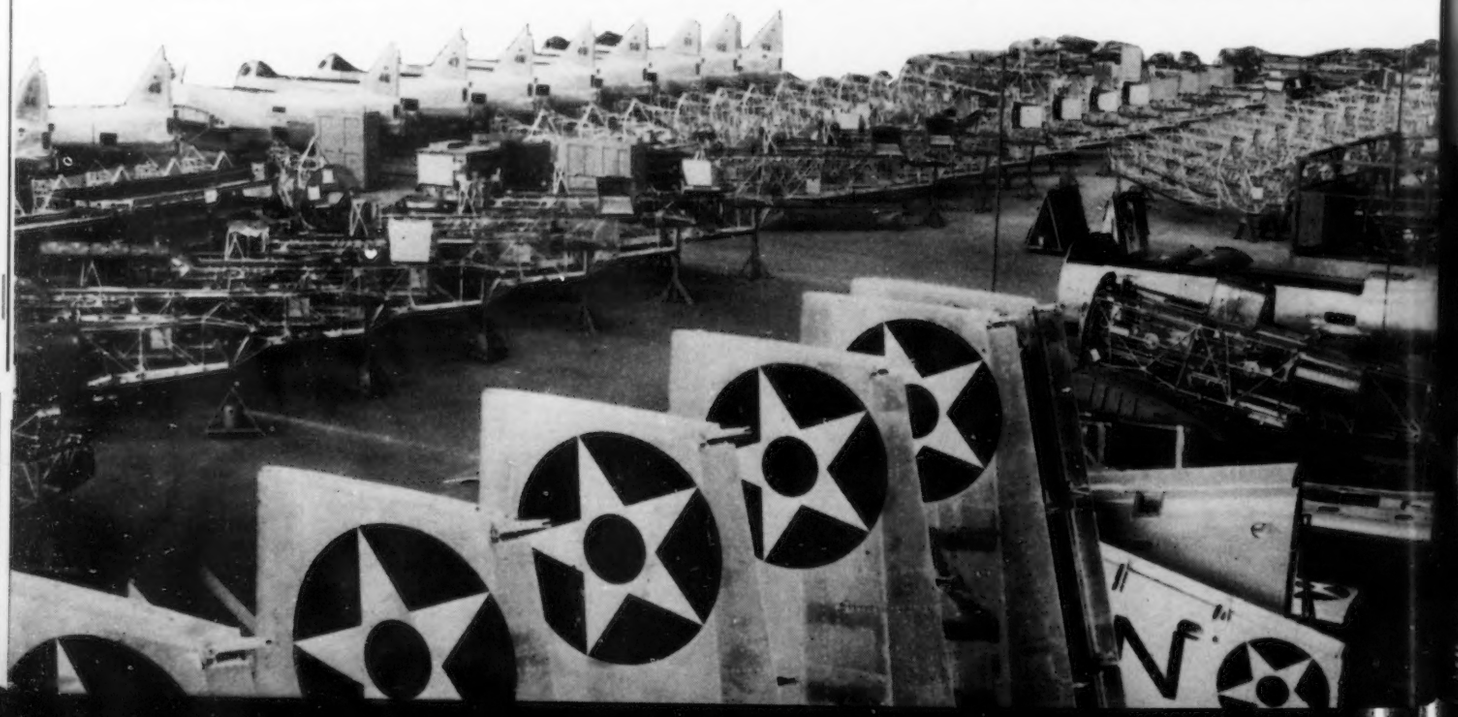
Machine tool production in many plants has already doubled over a year ago and the industry's output and capacity are increasing daily. The industry is confident that by the time final specifications for defense production have been determined, present plants realined or new plants built, and production schedules set up, the machine tools required will be ready for installation.

To my mind this is only one of countless examples of the fact that in the United States we do not need regimentation to insure national defense. I do not for a moment agree with the theory that a totalitarian government insures absolute solidarity of effort. To the contrary, such a government seems to me an international confession of internal weakness. It stands forth as public proof that the citizens of a country which embraces it will not cooperate except by threat of force. In the United States it takes no threat of force to insure cooperation.

But to insure cooperation it does require decisive and intelligent action upon the part of the administrative and legislative branches of government entrusted with the formulation of laws, rulings and regulations which form the premises upon which our defense program must be built. It is in this field that we have had inexcusable delays.

While billions were appropriated, plans and programs were held up pending definition and clarification of the basis upon which those billions could be put to work.

Months were spent trying to arrive



at some conclusions as to how much profit industry should be allowed, and haggling over the question of amortization. Businesses were expected to take enormous contracts on which terms could not be written because nobody knew yet what the terms were going to be. It was not until October, 1940—a whole year after war had broken out in Europe—that a bill was finally passed giving a concrete definition of amortization terms and profits taxes, thereby enabling industries engaged in national defense production to proceed on a basis of facts instead of guesses.

It was just this sort of playing politics with national defense that delayed so long the defense production of England—just this sort that made a shambles of the defense of France.

The delays in defense production which are due to the fact that specifications and amounts of various items have not yet been determined are of far different nature. It must be borne in mind that designs of tanks, planes and guns which only a few months ago were considered the last word in modern warfare have today, in the light of European developments, become obsolete.

Just what should we build *today?* This is the foundation stone of the whole program. No mistakes can be made—for upon today's designs and specifications will be based the mass production of months, or even years, to come.

Once production is started you can't change specifications without wrecking production. Materials and equipment planned for one set of specifications can't be switched overnight to meet a new set. The result would be months of delay and billions wasted.

Therefore we must not be hasty to criticize the Army and Navy for taking due time for the detailed planning and designing of the hundreds—even thousands—of various items of defense equipment.

And when specifications are determined, it takes time—it may take months—for a company to tool up for volume production. In an automobile plant, for instance, preparation for the turning out of a new model often takes practically a whole year.

We must give up the idea of expecting defense production of any great volume today. We are in this thing for a long pull—and what counts is not the output today, but the planning and preparation which will make for the greatest possible output tomorrow. And this output, I repeat, must be far greater than most of us now realize.

As the program develops, it will affect every one of us personally and directly. It will not be something that "they" are doing—it must, and will, be something that "we" are doing. For we will all play a part in it—and we probably will be called upon to make some sacrifices to help carry our share.

For instance, it seems to me very doubtful that the United States can build up maximum defense production and at the same time continue its present volume of production of normal peace time products.

No other country faced with rearmament on the modern scale has been able to do this. For months the production of peace time conveniences in England has been sacrificed. Sooner or later we may likewise face that situation here.

Certainly we can't expect new plants and new tools to handle all of our defense production. Much of it must of necessity be handled in present plants, and, insofar as possible, with existing tools. We will only be husbanding our resources and making maximum use of existing facilities by following this method. And if it involves sacrificing to some extent our normal production of the devices by which life is made more convenient and more comfortable, this is a small price to pay for the protection of our homes and our families.

We are all of us going to have to work harder over the next few years. We may have to work longer hours, and certainly we will have to develop and maintain a working morale which will keep us at top efficiency. We can't quibble about small matters or make mountains out of molehills.

On the whole, by comparison with most of the rest of the world, we have had a pretty comfortable time of it in these United States. But playtime is over. We've got a job on our hands.

"We must not be too hasty to criticize the Army and Navy for taking due time for the detailed planning of defense equipment. When specifications are determined, it takes time—many months—for a company to tool up for volume production."

International News Photos

Specifications for Carbide Tools

By GAYLORD G. THOMPSON
Madison, Wis.

THERE comes a time when users of carbide tools will contemplate or definitely decide to make some or all of their own carbide tools, that is, to purchase carbide tips or blanks and then manufacture the desired sizes and styles of shanks to which the carbide blanks are brazed.

There are a few good reasons why a consumer should make his own carbide tools. Carbide blanks do not cost as much as complete tools; therefore inventory burdens are less where it is necessary to carry a stock of tools for replacements. Then, too the actual machining of tool shanks will be found to cause no perceptible increase of manufacturing expense. If routed through the tool room where labor, equipment, overhead, etc., are already established, the intrusion of carbide tool shanks should cause no great amount of disruption of regular production activities. The manufacturing expense is there, whether tool shanks are made or not. And those orders for tool shanks do "fill in the gaps" very nicely.

Convenience and instant service are also enjoyed by the consumer who makes his own carbide tools. Often times the tooling up of a machine will call for a special tool that would produce the best results. The desired shape and size of carbide blank can be ordered at once and by the time the shank is completed, the blank will be available for brazing. Carbide blanks kept in stock will also be found to be suitable for special tools.

[Recent new and lower price lists on standard styles of carbide tipped cutting tools may alter the above picture somewhat. Rough blanks corresponding to styles Nos. 1 and 2 mentioned later by the author are now a stock item.—*Ed.*]

Blanks may be broken in use while the shank is still in good condition. Here is where considerable saving is effected in maintenance of carbide tools. All that is necessary to do is to remove the broken portions of the carbide blank and braze a new blank to the shank. Very likely the broken portion of the carbide that is removed from the shank can be used on smaller tools. These broken portions should be stored in proper receptacles that identify the grade of the carbide and the manufacturer so that there will be no error in their reapplication in the future.

The technic of brazing carbide blanks to shanks is so thoroughly and liberally explained in circulars and booklets published by carbide manufacturers that there is no need of dwelling on that subject in this article. However, there are other factors worth considering that enter into the construction of carbide tools and the most important one is manufacturing specifications.

When complete carbide tools are purchased from the carbide manufacturer, the problem of tool control is not so intricate as when the tools are made by the consumer himself. The consumer can purchase the complete carbide tool ground and ready for use, or in the milled and brazed condition and do the grinding himself. But when the consumer builds his own tools, he must present specifications to the shop so that they can proceed intelligently with the construction of the tool shanks. Each shank must be stamped with the identification of the grade of carbide that is brazed to it and special care exercised that a specific grade of carbide does not get misplaced or brazed on the wrong shank.

Specifications that would prove satisfactory where complete tools are purchased from the carbide manufacturer would hardly prove adequate in detail for use by the consumer in making his own tools. If, however, the consumer will be making his own carbide tools in addition to purchasing some standard styles complete from the carbide manufacturer, he should decide upon a form of specification that would be satisfactory for both procedures.

Before any definite decision can be made as to the type or form of specification to be used in the manufacturing of carbide tools, consideration must be given to the variety of styles of tools that will form the basis of all carbide tool construction. Fig. 1, which apeared in an article on carbide tools in the May 9 issue of THE IRON AGE, is reproduced here to illustrate a style sheet showing 10 different styles of carbide tools from which practically 80 per cent of the standard tools of most any shop can be generated. This style sheet refers only to tools that are "in the rough"—tools that have been completed up to the point of grinding, such as the commercial milled and brazed tools. They are carried in stock that way—like rough castings.

Note also that each tool has its own style number as shown at the top of each vertical column. Notice the second column from the left. These numbers which identify the respective shank sizes in the adjoining column to the left, are used in conjunction with the style number to denote the

STYLE No.	01		02		03		04		05		06		07		08		09		10	
SHANK SIZE	No.	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY	TOOL No.	TRAY
¼ x ¼ x 2¼	1	101	1					104	1												
5/16 x 5/16 x 2¼	2							204	1												
3/8 x 3/8 x 2½	3	301	1			303	1	304	1												
½ x ½ x 3½	4			402	2	403	2	404	2												
5/8 x 5/8 x 4	5	501	5	502	3	503	3	504	4	505	6	506	6	507	5						
¾ x ¾ x 4½	6	601	12	602	9	603	7	604	8	605	13	606	13	607	12						
⅞ x ⅞ x 5	7					703	14	704	14					707	14						
1 x 1 x 7	8	801	15	802	16	803	17	804	18	805	19	806	20	807	15					810	21
1¼ x 1¼ x 7	9																				
½ x 1 x 7	13	1301	22	1302	23	1303	24			1305	25	1306	27					1309	41		
5/8 x 1¼ x 8	14	1401	22	1402	23	1403	24			1405	26	1406	28								
¾ x 1½ x 9	15			1502	43	1503	30			1505	34	1506	35								
1 x 1¼ x 7	16			1602	29	1603	30	1604	33	1605	36	1606	37	1607	40					1610	21
5/8 x 1 x 6	17	1701	22	1702	31	1703	32	1704	33	1705	38	1706	39	1707	40			1709	41		
⅞ x 1 x 6	18																	1809	41		
¾ x 1 x 6	19			1902	44													1909	41		
¾ x 1¼ x 6	20	2001	22	2002	31	2003	32														
1 x 1½ x 8	21																				

ABOVE

FIG. 1—Style sheet for carbide tipped tools in the rough prior to finish grinding. The numbering system shown is the key to all shown is for tool style No. 01.

o o o

size of the tool shank. Thus, a shank measuring ¼ x ¼ x 2¼ in. is a No. 1 size and when affixed to any style number such as No. 01, the complete number would be 101, meaning that the style 01 tool has a No. 1 size shank. This same principle follows through with all the styles and sizes. As these numbers apply only to the rough tool, the numbers could very appropriately be termed as pattern numbers. Any variation in the length of the shanks of the tools can be identified specifically by affixing an alphabetical state to the number, like 101A, 101B, etc.

The number as shown in the column headed "Tray" is an arbitrary location of the tool in stock.

It is very important to have a style sheet and identify types and styles of tools by number in order to avoid costly duplications of tools in the shop. If numbers were applied promiscuously to each tool manufactured, it would not be long before the first tools will have been forgotten as to their styles. And if remembered, it would be difficult to locate them or their drawings if the specific number were not known. On the other hand, when the layout man assigns a group of tools to a machine set-up, he needs only to

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BELOW

FIG. 2—Tool detail blank printed from a zinc cut and perforated for filing in an 8½ x 11 in. ring binder. The blank shown is for tool style No. 01.

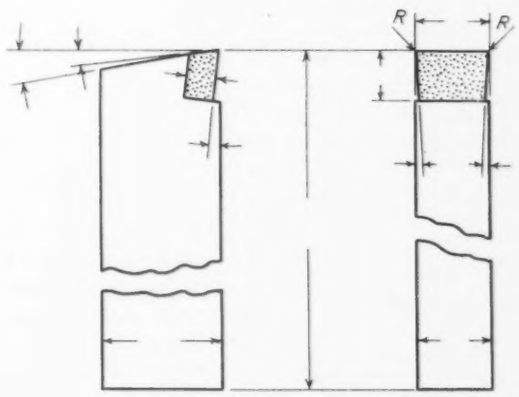
TOOL NO.

TOOL STYLE NO.

BLANK GRADE

TOOL CATALOG NO.

STYLE - 01



STOCK SIZE OF SHANK MATERIAL

REMARKS

DATE

AMOUNT ORDERED BY

page through the style record of that particular tool to pick the one that is suitable. If none is available, he can create a new tool as explained later.

Assuming that the tools are shown on the style sheet in Fig. 1 are adopted as the basis from which all standard carbide tools will be generated, the question then arises, how will detail manufacturing data to the shop be presented? The shanks must be machined. Proper sizes of carbide blanks and their respective grades must be designated. And then comes the grinding dimensions with its multitude of angles, clearances, and radii. Will there be a new number assigned to a tool for each change in the finished construction? Positively! Will a drawing be furnished for each individual tool to show dimension variations? Certainly! This sounds like a lot of "board work" but it is simple and easy.

Referring again to Fig. 1, note that only the "business end" of the 10 different styles of carbide tools are shown. Now look at Figs. 2, 3 and 4, showing typical detail drawings of a few of the 10 tools. Similar sketch blanks would be made for all styles of tools used. These drawings are not made individually but are prints from zinc plates. In other words, a master drawing is made of each style of tool. Zinc plates are made and the desired quantity of the drawings of each style of tool is printed on good bond paper suitable for filing in a three-ring note book, preferably 8½x11 in. Dimensions are omitted on the prints but space is provided for them.

Fig. 5 illustrates how the drawing Fig. 2 looks when dimension figures are posted together with other information as provided on the form. Assuming that the layout man desires a style of tool such as No. 01 as shown in Fig. 5, he will refer to his record of tool numbers, which merely a list in numerical sequence, and appropriate the next open number which we will say happens to be 27. No effort need be made to attach any significance or code to the number of the finished tool. The numbers are applied in *straight numerical sequence* regardless of the style or type of tool. But, when the drawings are filed in the loose-leaf ring-book which is kept in the office, they are filed according to *style* number, which in the case of Fig. 5 is No. 801. The reason for this filing procedure is that the layout man will know the type or style of tool he desires when making a set-up; therefore, it is more convenient for him to refer to the specific file or group of drawings constituting that particular style

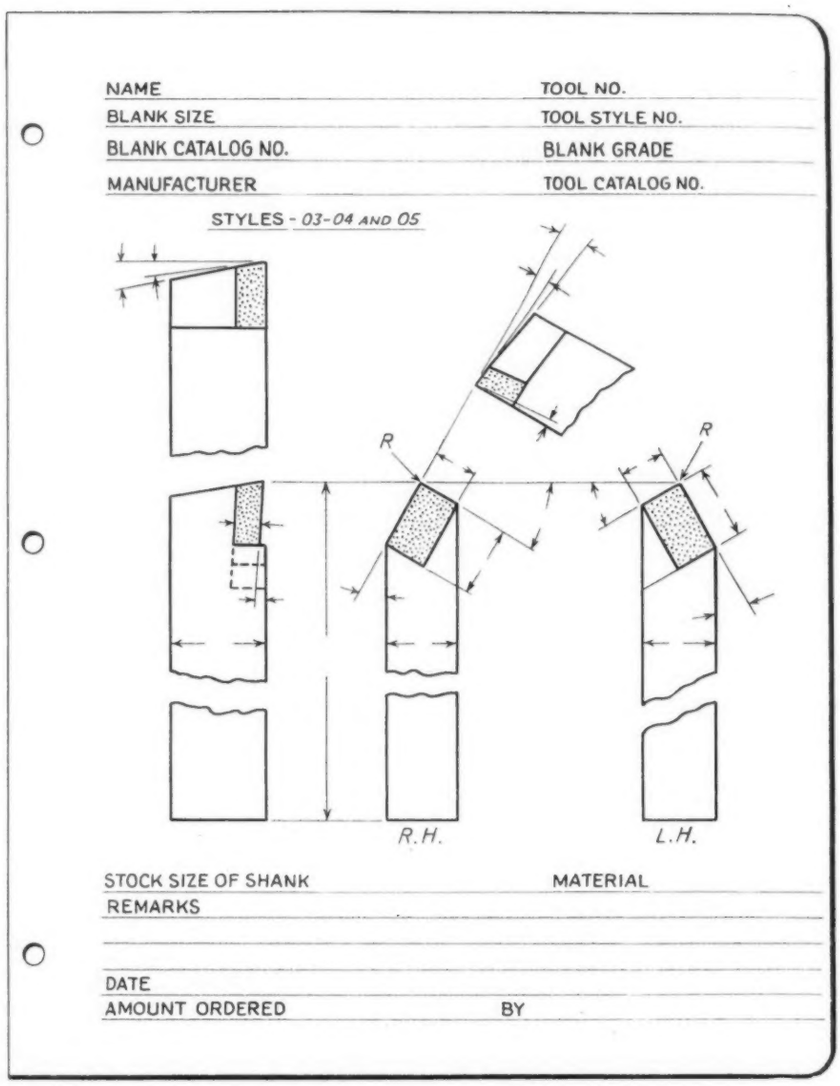


FIG. 3—The same tool detail blank serves for carbide tool styles Nos. 03, 04 and 05.

of tool. If he finds no tool available or satisfactory for his particular need, he proceeds to issue a new tool number and fill in the necessary dimensions and other data in the spaces provided on the standard printed sketches.

A carbon copy of the drawing could be made and attached to the shop order if the tool is to be rushed to completion and if the carbide blank or tip is in stock. On the other hand, blueprints can be made and sent along with the shop order.

Whether blueprints or carbon copies are made of tool drawings, a copy should be available for the grinding room for permanent file. This file is *not* divided or indexed according to styles of tools but the drawings are filed in straight numerical sequence according to the tool number. The man who grinds the carbide tools is not interested in the style divisions of the file. When he gets a tool to grind, he notes the tool number and then turns to the page in the file or loose leaf book that has the same number. This page will show the angle specifications to which the tool is to be ground.

If the grinding department foreman finds that a carbide tool is damaged or that a tip needs replacement, he turns to the tool or page number of the file or book and from this page or drawing he obtains the size, grade, and catalog number of the carbide blank that is specified for this type

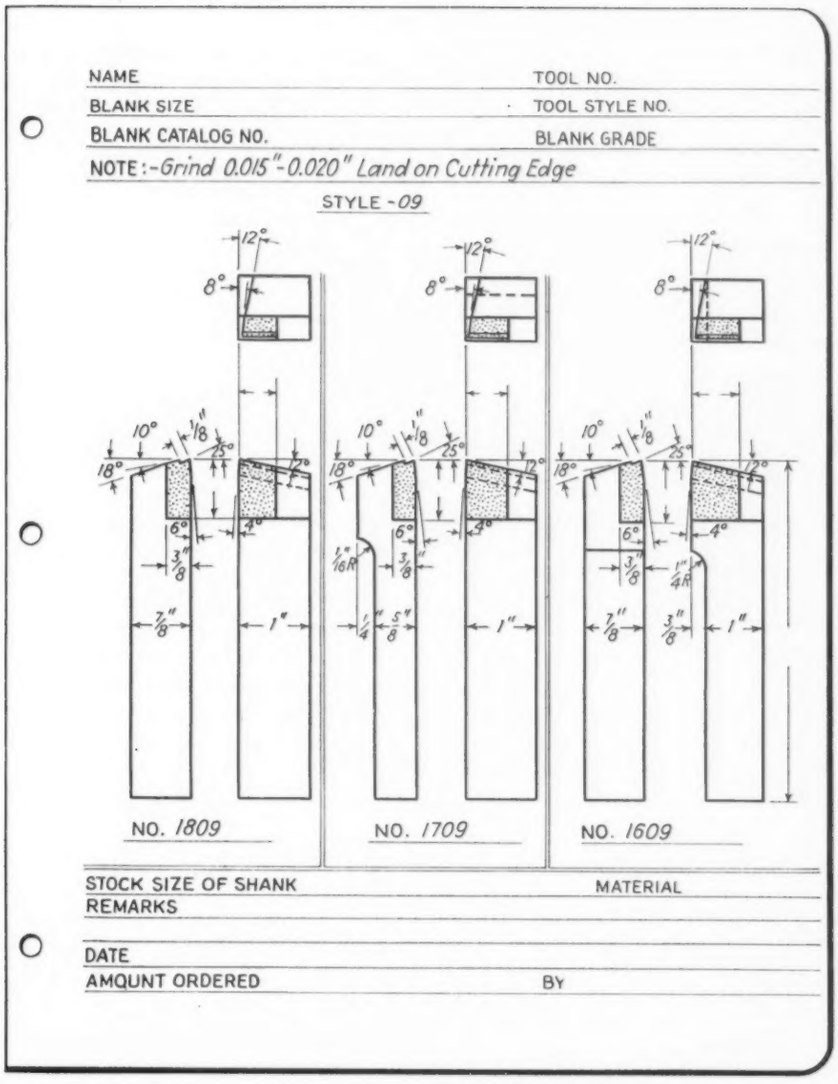


FIG. 4—Except for the size of the carbide blank, which may vary for different applications, the tool details, such as rake and clearance angles, are fixed for style 09 tools in the three shank sizes shown. This is a steel cutting tool, with chip curler incorporated in the carbide blank. o o o

of tool. He requisitions this blank from stock. If the blank is not in stock, the prevailing method or routine of purchasing is then used.

If it so happens that tool No. 27 as shown in Fig. 5 is also available, in the rough or otherwise, from the carbide manufacturer, the catalog number of the tool and the name of the manufacturer is inserted in the spaces provided at the top of the form. Thus there is a cross index to two sources of tool supply.

It will be noticed in Fig. 5 that two angle dimensions are given where they involve clearances. The small angle dimension, namely 6 deg., refers to the clearance on the carbide. The 10-deg. angle refers to the clearance on the steel shank. The reason for this is to avoid as much as possible the grinding of steel on soft silicon wheels and the filling up of diamond wheels with steel particles when grinding the carbide.

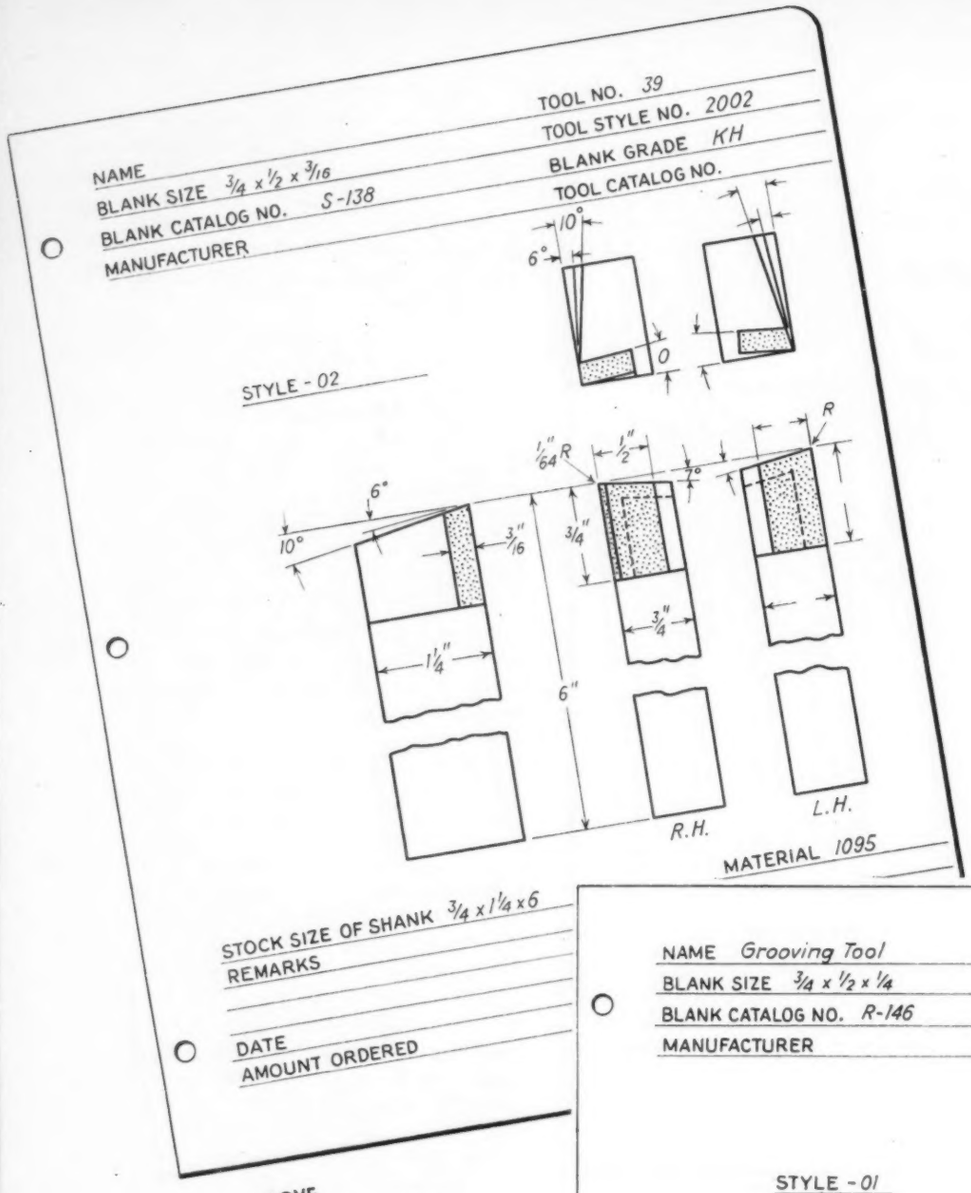
The tool as shown in Fig. 5 has dimensions and specifications characteristic of a carbide tool for cutting cast iron. The top backrake of 6 deg., while satisfactory for cast iron, is not needed on a tool used for cutting steel. The chip curler could take care of that. Fig. 6 shows a filled-in printed sketch of a style No. 02 tool. The blank form can be used for either a right-hand or a left-hand tool as noted. This tool is for cutting steel; therefore a line representing a chip curler is drawn along the cutting edge as shown in the sketch. If a radius is to be ground on the point, the chip curler line will of course be at an angle. A chart showing the angle and dimensions of chip curlers was published in the July 4 issue of THE IRON AGE under the subject of "Chip Curlers for Carbide Tools."

Now, having a method by which specifications can be given to the shop to make carbide tools and also to enable these specifications to serve equally as well where tools are purchased, it would be interesting to know just which of these tools are to have the heaviest demand. It would also be valuable to know which tools have the highest mortality. This information helps to establish proper stock balances.

When a manufacturing order is issued for making carbide tools, the order is for the tools in only the brazed condition, in spite of the fact that the drawings give dimensions for complete tools. When the tools are completed in the rough, they are put into rough stock and recorded under the tool style number which may be any of the numbers as shown on the style sheet Fig. 1 or as shown in Fig. 5 as No. 801. The shop order does not call for the tools under the finished tool number but under the tool style number. This is practically the same as a stock order. Later, when finished tools are desired, a requisition slip is made out in triplicate, the form of which is shown in Fig. 7. The original goes to the rough stock clerk to deliver the tools to the grinding room. The stock clerk keeps the requisition in a file divided according to styles of tools. The duplicate copy of the requisition goes to the foreman of the grinding room who has the tools ground as designated by his copy of the drawing bearing the number of the tool as noted on the requisition.

When the tools have been ground, they are delivered to the tool crib, together with the duplicate copy of the requisition. The tool crib attendant signs the duplicate requisition as a receipt and forwards it to the inventory clerk or some other clerk who might be assigned to the duties of keeping these records. After a time, these duplicate and receipted requisitions can be grouped according to styles of tools and analyzed. Thus complete and authentic information as to carbide tool turnover is available for any desired action that might be taken.

The numbering of carbide tools in straight numerical sequence as a function that is distinctly separate from the application of style numbers, makes it a very simple and convenient



ABOVE

FIG. 6—Tool style 02 specification blank forms can be used for either right or left-hand tools. The dimensions are shown filled in for a right-hand tool, with a chip curler drawn along the cutting edge indicating that this tool is to be used for steel cutting.

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method for the tool crib attendant to file the tools away. Trays or drawers need only to be numbered in sequence, with reservations of course as to sufficient space for the storing of later tools. Thus there are files of drawings indexed by the tool number as the page number, and the trays in the tool crib numbered and indexed likewise. This promotes better universal understanding of tool control, expedites service at the tool crib window and eliminates the possibility of transposition as is the case where long numbers are tied up with alphabetical prefixes. The short numbers are more convenient when being posted on layouts. They do not crowd the drawings.

Questions may be asked. Will not the issuing of drawings, printed or otherwise, eventually build up a bulky, cumbersome file of tool drawings the numerical volume of which would have a tendency to create errors and duplications? Is not this method expensive and time absorbing—involving a lot of clerical work?

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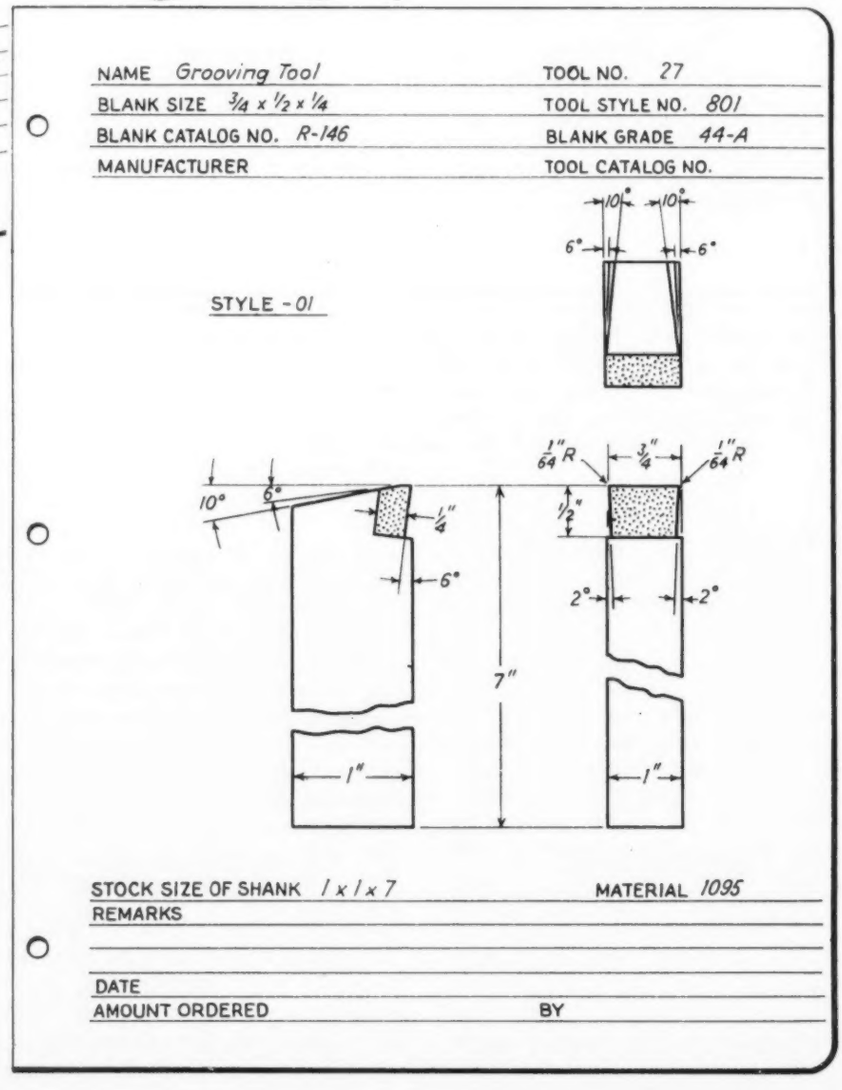
BELOW

FIG. 5—This is what the tool detail blank form shown in Fig. 2 looks like when it has been filled out with dimensional data for a specific application.



In actual operation and control of over 4000 tools, less than 200 drawings were required to cover the specifications of these tools. Having the 10 styles of tools as a foundation from which finished tools are evolved, it is surprising how few different types of tools are really needed and how many different operations can be performed by one type of tool. Especially was this found to be true with the styles Nos. 05 and 06 facing and turning tools respectively. Practically every set-up involved the use of these two tools, the only differences being in the radii of the cutting points. Then too, the fact must not be overlooked that the stock of tools is almost doubled because of the necessity of having different grades of carbides for cutting cast iron and steel. But even with this handicap the number of drawings that will be found necessary will be very small in comparison to the advantages gained.

It requires only a few minutes to post the dimension figures on the printed standard drawing. There is no actual drawing to be made. Most carbide tools are valuable. Isn't it worth the printed form, costing less than ½c., plus about 15 min. labor time for the posting of dimension figures, to have a record of tools which cost from $2 to $35 each? Not only that, but there is not an initial specification cost when replacement orders are issued.

CARBIDE TOOLS REQUISITION

Style No. 801 Tool No. 27

Grade 44a Am't. 6

For 37-4B-3 Oper. 3

Send to Grinding Room

Received Date

Send to Tool Crib

Received Date

Requested by a. Jones Date 8-3-40

FIG. 7—When finished tools are desired, a requisition slip such as this is made out in triplicate.

Junior Motors Blackened for Protection

MINIATURE gasoline motors, such as those made by Junior Motors Corp., Philadelphia, are subject to considerable handling in the retail stores with the result that finger stains soon appear on the brightly polished surface. The motors are also subject to dampness in stocks, during shipment and while on display. All this results in stock which looks shop worn, old and uninviting to the prospective purchaser.

To eliminate the objection all cylinders are now given a black coating. The operation is shown in the accompanying photograph, where the operator is lifting a tray of the tiny cylinders from the bath—note the black color, as compared with the basket of untreated cylinders in the foreground.

The bath is made up of six parts water to seven parts Jetal salts by weight. This solution is kept at a temperature of 285 deg. F. by a gas burner. The cylinders are placed in a tray as shown, 36 pieces to the tray and the tray lowered into the bath where it is allowed to remain for 8 min. The tray of parts is then removed from the salts, rinsed in hot water, then dipped into soluble oil at 250 deg. F., to remove any moisture and coat the parts with a very fine film of the oil. The parts may now be handled as much as desired without fear of damaging the surface. Motors which have been in service for some time have been examined and found to be about as perfect in finish as when they left the plant.

Flame Hardening Standardization

By A. L. HARTLEY
Metallurgist, R. K. LeBlond Machine Tool Co., Cincinnati

IN this extensive and very informative research, a series of tests which have produced data that give accurate reproduction of results, uniform penetration of hardness, and uniform structures will be considered. Last week the characteristics of three types of iron were described; also given was the effect of various heat treatment on the microstructure and hardness of each material. Herein, in the second section of this five-part article, the operating conditions for the flame hardening of chromium-molybdenum cast iron by the progressive method is described.

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IN this part of the discussion a series of experiments which produced standardized operating conditions for developing a hard case 3/32 in. to 5/32 in. deep on flat surfaces of chromium-molybdenum cast iron will be considered. These experiments were conducted with Airco equipment of the type previously described. All of the experiments considered herein were made by the progressive hardening method; that is, the part to be hardened remained stationary, and the torch or flame was moved over the work at a uniform rate of lineal travel. The specimens used for these tests were of the same general design as shown in Fig. 5. They were made with widths varying from ¼ in. to 3 in. and were 6 in. long.

The allowable analysis range for these sample parts was as follows:

Total carbon	= 2.90 to 3.20 per cent (3 per cent desired)
Combined carbon	= 0.60 to 0.85 per cent
Silicon	= 1.70 to 2.10 per cent
Manganese	= 0.70 to 0.95 per cent
Molybdenum	= 0.35 to 0.45 per cent
Chromium	= 0.0 to 0.30 per cent[1]

The preliminary tests made in arriving at some basic set of operating conditions were conducted in the manner quite frequently followed. The tip or cone of the flame was set 1/16 in. to ⅛ in. above the surface of the specimen, and an attempt was made to obtain satisfactory operating conditions by adjusting the gas flow and rate of lineal travel. Fractures of hardened specimens were made and conditions adjusted until the desired penetration was obtained. When all conditions were very accurately set, fairly satisfactory results could be obtained on test specimens. However, when production parts were run it was found very difficult to produce consistent results. In some cases the surface of the iron would tend to burn, and in other instances the hardness would not be uniform. There was also a very appreciable variation in the depth of hard case produced.

Although at least 150 basic tests were made on flat surfaces in an attempt to arrive at a suitable set of operating conditions, it was found absolutely impossible to produce uniform results with the tip or cone of the flame set so close to the work. In the course of making these 150 tests the rate of lineal travel was adjusted between 7⅜ in. per min. and 4 in. per min. Satisfactory depth of penetration could be obtained at any of the speeds used by

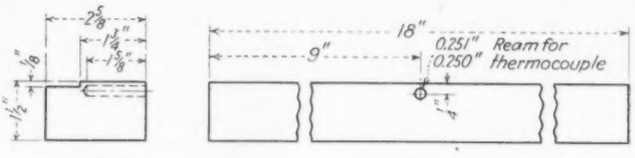

FIG. 5—Design of specimens used for the tests.

[1] The chromium content to vary according to the section of the casting involved. For castings of average section the chromium range should be about 0.10 to 0.20 per cent.

adjusting the volume of gas flow. However, it was found impossible to duplicate results regardless of the rate of lineal travel or gas pressure used. The tests conducted at the slower rate of lineal travel proved less hazardous from the standpoint of surface burning, but otherwise there was no great improvement.

A study of the microstructure of the iron as furnace hardened and as flame hardened showed that the flame hardened structures were very inferior to those produced by proper furnace hardening. The photomicrograph of Type 3 iron, Fig. 4 (Oct. 17 issue), showed a uniform pearlitic matrix of the base iron, and the fine acicular hardened structure produced under a wide range of hardening temperatures. Photomicrograph, Fig. 6, shows a very coarse structure produced when the same iron was flame hardened under improper operating conditions as tabulated. It may be observed from Fig. 6 that large areas of retained austenite

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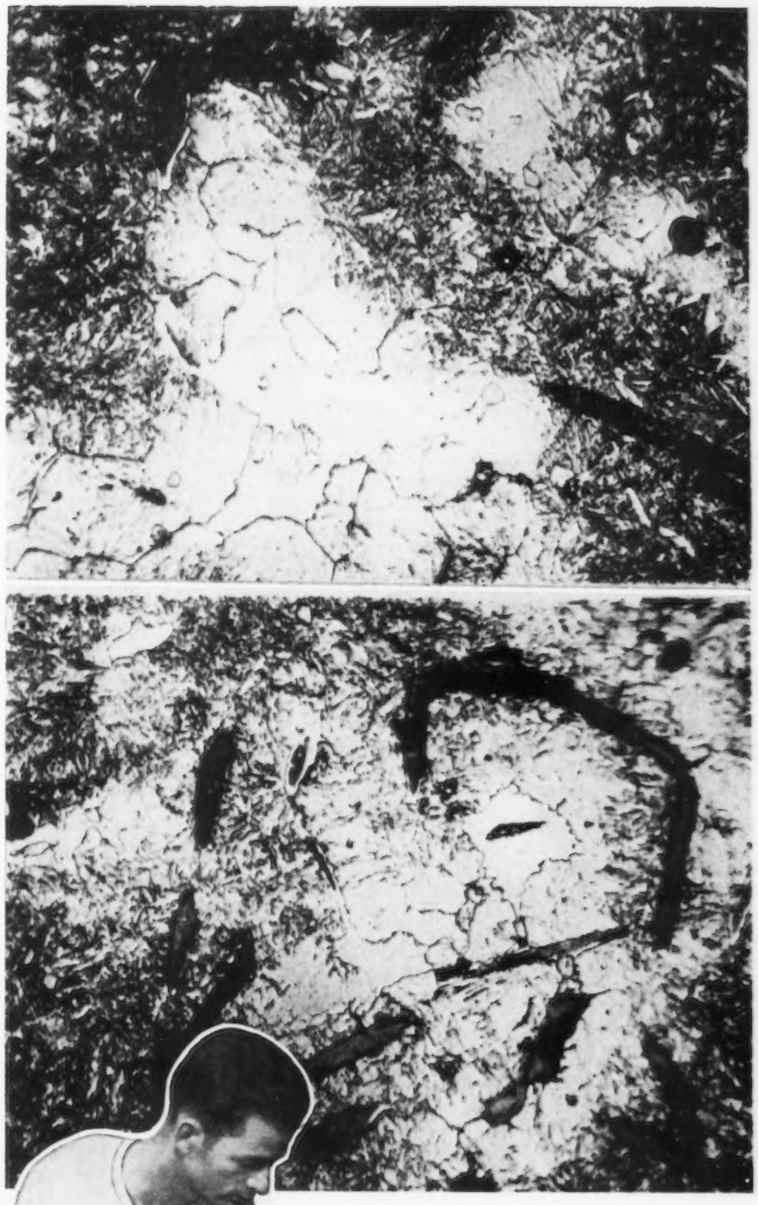
RIGHT

FIG. 6—Inferior microstructure obtained when cast iron is flame hardened under improper conditions. (Above) Hardening conditions: rate of travel of 7⅜ in. per min.; tip or cone of flame 1/16 to ⅛ in. above surface; other conditions adjusted to produce a ⅛-in. hard case. (Below) Hardening conditions: rate of travel of 4 in. per min.; tip or cone of flame 1/16 to ⅛ in. above work; other conditions adjusted to produce ⅛ in. hard case. Both views at 500 diameters; etched in nital.



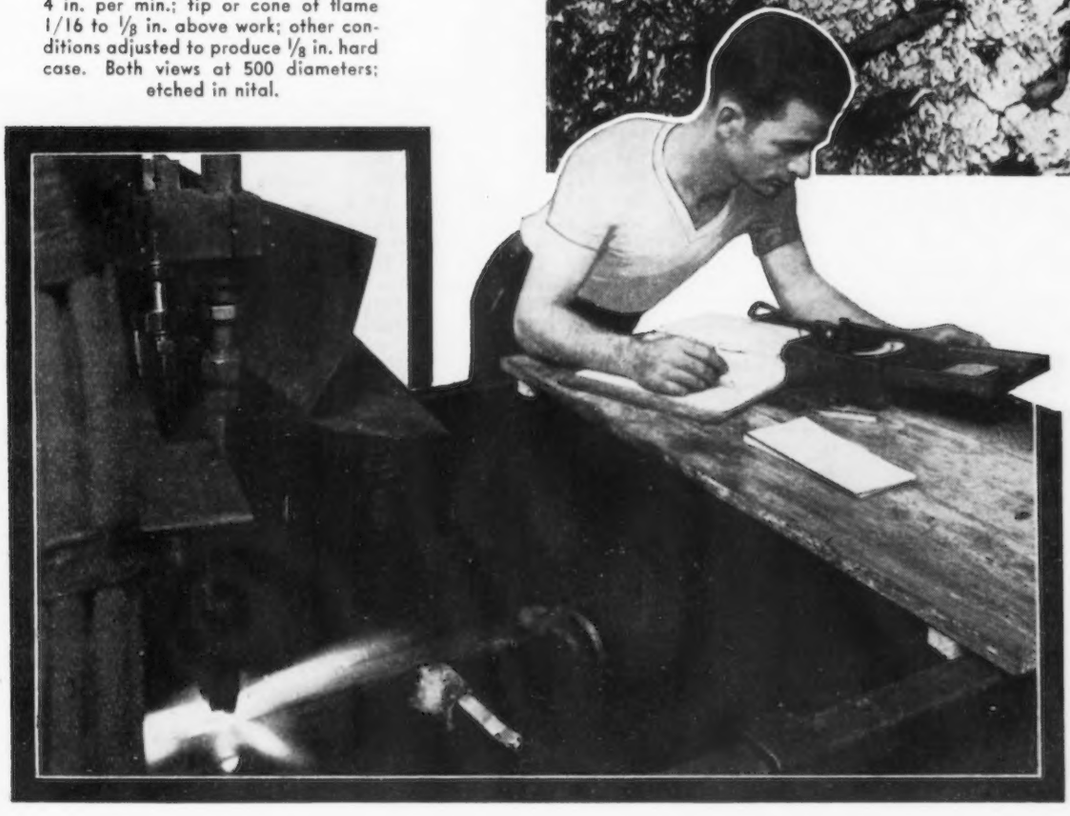


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FIG. 7 — General arrangement of the test set-up.

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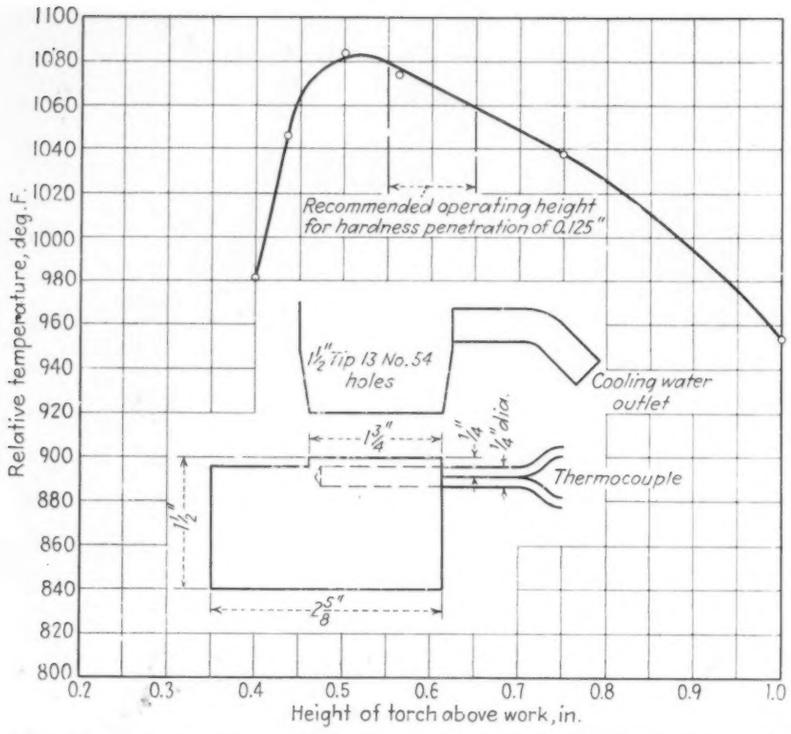

FIG. 8—Effect of torch height on the temperature of chromium-molybdenum cast iron 0.125 in. to 0.375 in. below the surface. The torch was operated under the following conditions: Mixer No. = 10; gas pressure = 13 lb. per sq. in.; tip = 1½ in.; number of flames = 13; speed = 4 in. per min.

are present and microscopic cracks are numerous. The Rockwell C hardness of these specimens was 48 to 51, but the sclerescope hardness varied from 65 to 80. These results definitely show that the surface of both tests bars was hardened at *effective surface temperatures*[2] in excess of 1700 deg.

A product flame hardened under these operating conditions would definitely have inferior wearing properties and would be susceptible to spawling or flaking if subjected to impact or deflection.

It should be noted that the rate of lineal travel used on one of these specimens from which the photomicrographs were taken was 7⅜ in. per min., whereas it was only 4 in. per min. on the other specimens. Numerous specimens were examined which had been hardened at intermediate speeds and they were found to have very similar structures. The fact that the surface hardness was not uniform combined with the fact that the structures showed an appreciable amount of retained austenite definitely indicated that regardless of the operating conditions employed to obtain a 3/32 in. to a 5/32 in. hard case, the surface was overheated a sufficient amount to produce a very coarse structure.

In addition to the fact that very undesirable metallurgical results were produced by these operating conditions, surfaces were frequently melted to such an extent that they could not be ground to a satisfactory finish. This condition resulted, if for any reason, the tip or cone of the flame came closer to the surface of the work than the pre-determined distance. These slight variations were usually caused by one of two factors which could not be readily controlled. A small carbon particle in a tip might frequently cause a single flame to be momentarily slightly longer than the other flames from the same tip. A minor fluctuation such as this would frequently be sufficient to start the melting action. After the melting had started it could only be stopped by raising the tip to

[2] As previously stated the actual surface temperature of a part being flame hardened cannot be determined by the use of present commercial instruments. However, the microstructures of flame hardened parts can be compared to those produced by quenching the same material from known temperatures. When a flame hardened and furnace hardened specimen have identical microstructures the temperature from which the furnace hardened specimen was quenched is called the *effective temperature* of the flame hardened specimens. For example if a flame hardened specimen has an identical microstructure to a furnace hardened specimen of the same material which was quenched from 1550 deg. F. The effective temperature from which the flame hardened surface was quenched is said to be 1550 deg. F.

TABLE III

Relative Temperature, Deg. F., at a Given Point as Torch Approaches

Distance From Work to Tip of Torch	Lineal Distance of Torch from Thermocouples								
	Approaching							Past	
	6	5	4	3	2	1	0	½	Operating Conditions
1	149	166	192	222	226	253	490	974	Mixer No. =10
1	149	170	196	222	231	275	642	991	
1	145	162	188	222	231	320	655	923	Tip size =1½ in.
1	145	162	183	218	222	320	621	940	
1	140	158	183	213	226	311	651	944	No. flames =13
Average	146	163	188	220	227	296	612	955	*Acetylene Pressure =13 lb.
¾	145	179	213	222	239	329	577	1045	Rate of lineal travel =4 in per min.
¾	145	162	200	213	218	244	533	1035	
Average	145	170	207	218	229	287	555	1039	Quench =none
9/16	157	166	183	209	209	244	599	1074	*Note—Oxygen pressure adjusted to produce a neutral flame.
½	153	174	205	209	213	266	599	1109	
½	149	166	196	200	209	222	512	1075	
½	157	170	200	205	205	222	533	1071	
Average	153	170	200	205	209	237	548	1085	
7/16	...	...	...	...	...	...	...	1065	
7/16	...	...	...	...	...	...	...	1028	
Average	...	...	...	...	...	...	...	1046	
13/32	...	...	...	...	...	...	...	981	
13/32	...	...	...	...	...	...	...	981	
Average	...	...	...	...	...	...	...	981	

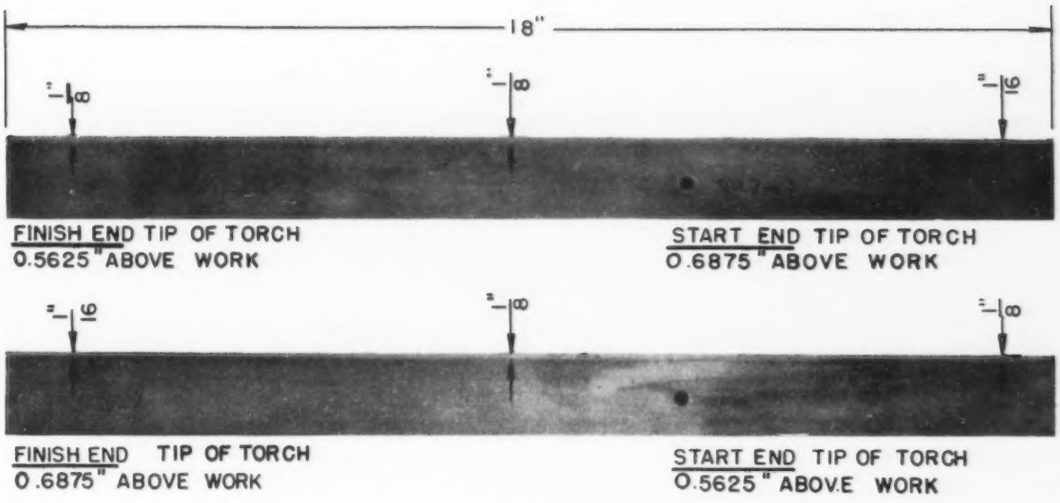

FIG. 9—Test specimens used to determine variation in depth of penetration with distance of torch tip from work surface. Specimen 327—1 above and 327 below.

allow a slight amount of cooling. Due to the very delicate operating conditions it was quite difficult to re-position the tip to obtain satisfactory results after it was moved. A second factor which caused the distance between the cone of the flame and the work to vary occurred when parts longer than 8 in. were hardened. This variation was caused by the expansion of the surface to which the heat was applied. This expansion was resisted by the cold base metal and resulted in an appreciable amount of bowing which caused the work surface to come closer to the tip as the middle was approached. (This characteristic will be more thoroughly considered under the heading of distortion).

These unsatisfactory results could not be attributed to the operator, because all tests were conducted under very close supervision and all setups were made with the utmost precision. It was decided that the idea of operating the torch so that the cone of the flame was within 1/16 to ⅛ in. of the surface was basically incorrect. To definitely establish the soundness of this theory two series of tests were made on blocks of the proportions shown in Fig. 5. The photograph shown in Fig. 7 illustrates the general arrangement of the test set-up.

A series of tests was run to determine the relative amount of heat in a specimen at a given point as the torch approached and passed said point. These experiments were conducted with the distance between the tip of the torch and the work surface varied from 0.4 in. to 1.00 in. In conducting these tests all other conditions were kept constant. A quenching medium was not used because the objective was to obtain relative results, and the use of a quench would have introduced another series of variables. The thermocouple was set beneath the surface so that it would only be effected by the temperature rise due to conduction and the flames would not impinge directly on it.

The results, as tabulated in Table III, conclusively show that an appreciable amount of heat is not conducted into the work more than ¾ in. ahead of the point of application of the flame. This condition holds true regardless of the distance between the tip of the torch and the work surface. This data also shows that the maximum heat (⅛ in. to ⅜ in.) below the surface is not reached until the flames have passed a given point approximately ½ in.

The maximum temperatures, as tabulated in Table III, are plotted graphically in Fig. 8. From this curve it can be readily observed that the temperature of the metal ⅛ in. to ⅜ in. below the surface increased at a uniform rate as the distance between the work surface and the torch tip was decreased from 1 in. to 9/16 in. However, when this distance was decreased to ½ in., the recorded temperature was only slightly higher than that obtained at a distance of 9/16 in., and as the space was further decreased to 7/16 in. and 13/32 in. respectively there was a very sharp drop in the recorded temperatures. These results can be explained by the fact that there was no surface melting when the distance between the work surface and the tip of the torch was 9/16 in., but there was a slight amount of surface melting when the distance was decreased to ½ in., and a very appreciable amount as it was decreased to 7/16 and 13/32 in. That is, when the tip of the torch is lowered to a position where surface melting takes place, a certain amount of the heat energy is used up in transforming the iron from the solid to the liquid state.

It may be observed from the curve in Fig. 8 that there is a range between 0.55 in. and 0.65 in. in which the recorded temperature only varied 20 deg. F. and was only approximately 10 deg. to 30 deg. F. below the maximum temperature recorded. This would seem to be a desirable operating range because almost maximum temperature at a depth of ⅛ in. to ⅜ in. below the surface was obtained, and a slight variation in tip height would not be of vital importance.

A preliminary check on the above theory was made by hardening two specimens identical to the one shown in Fig. 5 in accordance with the following procedure:

Specimen No. 327, Fig. 9, was set up in such a manner that the tip of the torch was 9/16 in. (0.5625 in.)

TABLE IV

Hardness Variation Between the Base Metal and the Surface on a Sample of Chromium-Molybdenum Cast Iron Flame Hardened Under the Proper Conditions to Produce a ⅛ In. Thick Hard Case.

Distance From Base Metal	Sclerescope Hardness	
Specimen Number	327	327-1
Base Metal	32	32
0 (visible line on etched specimen)	40	45
1/64	58	62
1/32	68	72
3/64	75	74
1/16	72	75
5/64	72	78
3/32	75	81
⅛ (surface)	70-75	68-75

above the work at the start and 11/16 in. (0.6875 in.) above the work at the finish.

Specimen No. 327-1, Fig. 9, was set up so that the tip of the torch was 11/16 in. (0.6875 in.) above the work at the start and 9/16 in. (0.5625 in.) at the finish. All of the other operating conditions were identical and are herewith tabulated.

Tip Size = 2 in.
No. of holes (open) = 15
Size of holes = No. 56 drill (0.0465 in)
Mixer No. = 15
[3]Acetylene pressure = 10 lb. per sq. in.
Rate of lineal travel = 4 in. per min.

Both specimens were submerged in water as shown on Fig. 10.

As may be readily observed from Fig. 9, the depth of penetration of hardness on both samples varied from 1/16 in. to 1/8 in. as the distance between the work surface and the torch tip varied from 11/16 in. (0.6875 in.) to 5/8 in. (0.625 in.). However, there was practically no variation in the depth of penetration as the distance between the torch tip and the work surface varied from 5/8 in. (0.625 in.) to 9/16 in. (0.5625 in).

[3] Note—The oxygen pressure is adjusted to produce a neutral flame.

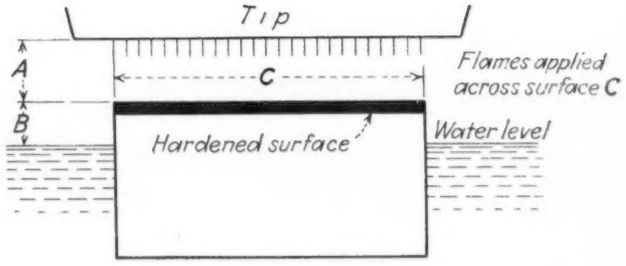

FIG. 10—Method in which specimens in Fig. 9 were submerged in water. This is type No. 1, a single flat surface.

The fact that the direction of travel had no effect on the depth of penetration is in exact agreement with the results tabulated on Table III in which it is shown that no appreciable amount of heat is conducted more than 3/4 in. in advance of the flame. This test also showed that varying the distance between the tip of the torch and the work surface within the range of 5/8 in. (0.625 in.) and 9/16 in. (0.5625 in.) does not appreciably affect the final results.

A hardness exploration of the surfaces of these specimens showed a uniform average of 48 to 53 Rockwell C, or 70 to 75 Sclerescope. A series of hardness readings taken at 1/64 in. intervals through the hardened zone are shown in Table IV. From this table it may be noted that a transition zone of approximately 3/64 in. exists before full hardness is reached.

Ed. Note—Next week the author continues with the third section of this article, with attention directed specifically to standardized operating conditions.

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Electroplated Alloy Coatings

ELECTROPLATED alloy coatings in a variety of colors for many applications are in large daily production in American industry, therefore can no longer be termed laboratory curiosities, according to Dr. Charles L. Faust, research engineer of Battelle Memorial Institute, who addressed the recent seventy-eighth general meeting of the Electrochemical Society, meeting in Ottawa, Canada.

Although a method for the electrodeposition of brass, an alloy of copper and zinc, was discovered nearly 100 years ago, only in very recent years have other alloy coatings begun to replace or supplement electroplated coatings of single metals, as chromium, nickel, silver, gold, copper, and others.

That the electroplating industry is a vast one is evidenced by the fact that the automobile industry alone used 3500 tons of electrodeposited coatings in a recent year.

Alloy deposition is considered as any process where two or more metals are deposited simultaneously and in which, due to this codeposition, special properties are imparted to the electroplate. In general, alloy deposits are denser, harder, and brighter than plates of single metals, Dr. Faust pointed out. There are certain composition ranges where alloy deposits have been found more corrosion resistant, more adherent to the basis metal, more readily buffed, more suitable for subsequent plates, more readily deposited over a wider range of operating conditions than one or both of the individual metals.

Processes for the deposition of brass, bright metals, bronze, black molybdenum, black nickel, and karat gold are generally known. Karat gold is used widely on jewelry and is available as the well-known green, white, or yellow golds.

An excellent example of adapting alloy deposition to an engineering problem is found in the use of brass plating to insure rubber adhesion to steel. Most of the fast curing, commercial rubber stock will adhere to so-called alpha-brass but in general not to other metals and alloys. The process has been in operation for a number of years in the rubber industry for making rubber-lined steel acid tanks and other rubber coated metal products.

Many of the bearing alloys used in the automotive industries are electroplated on strong steel backs. These include such combinations as cadmium-silver and silver-lead. According to Dr. Faust, the silver-lead bearing alloy, a development of the Battelle laboratories, is especially suited for aircraft engine use and probably will see wide use in that field.

Gear Manufacturers Meet at Skytop

V. SETH EBERHARDT
President of the American Gear Manufacturers Association

o o o

ONE of the chief problems facing a trade association in furthering the national defense program is to help in mobilizing the industrial forces of the nation so as to properly arm, yet not go over to totalitarian methods. This thought was expressed by Philip P. Gott, manager of the trade association division of the Chamber of Commerce of the United States, in addressing the 23rd semi-annual meeting of the American Gear Manufacturers Association at Skytop, Pa., Oct. 14 to 16. The earlier technical session on Monday, Oct. 14, was previously reported in THE IRON AGE. Speaking further of the relationship between trade associations and government, Mr. Gott indicated that trade associations are founded on democratic principles and that we must arm to defend these principles as well as our geography.

In general he defined the functions of a trade association as twofold: one microscopic—the study of individual problems; the other telescopic—the study of broad economic problems and long range planning in relation to the whole economy. Under the first heading, Mr. Gott listed such problems as those relating to production, distribution, finance, personnel and marketing. Right now trade associations could be helpful in determining the capacity of their respective industries to produce goods for national defense. The establishment of uniform selling practices are desirable, but Mr. Gott indicated that associations went too far in the NRA Code days in setting up rituals as to the rights of buyers and sellers.

In the personnel field, trade associations are outstanding training means. Mr. Gott cited as many as 30,000 people in one trade association course. Such groups are also useful in making surveys of wages and hours in connection with government contracts coming under the Walsh-Healey Act. The speaker also indicated that the question of compensating for lost time of drafted employees is facing trade associations, as are requests for deferment of essential employees. Primarily, however, trade associations must develop a program of public relations to avoid legislation detrimental to business.

In presenting a report for the commercial committee, W. L. Schneider, sales manager of the Falk Corp., stated that aside from the large amount of turbine reduction gear business tentatively placed in connection with the 70 per cent expansion of the United States Navy, at least 20 per cent greater production volume could be expected by makers of commercial speed reducers as a result of the defense program. Mr. Schneider believes, however, that it will be three to six months before the full impact of the program will be felt in the industry. He looked for a large amount of replacement business from steel mills as a result of capacity operations seen for some time to come. Referring briefly to the Second Revenue Act of 1940, Mr. Schneider considered the most important feature the suspension of the Vinson Act. A tremendous cost accounting problem has thereby been eliminated for any manufacturer doing work for the Navy.

In discussing this report of the commercial committee, N. C. Goin, Nuttall division, Westinghouse Electric & Mfg. Co., cautioned members of the association to be very careful in handling orders carrying heavy penalties on delivery. The penalties will still be applied, despite the sidetracking of machine tools on order to other manufacturers with higher priority ratings.

Silent Chain Drives

In a paper presented by H. A. McAninch, engineer of the Link-Belt Co., on motion characteristics of silent chains, the author indicated that such motions may be analyzed as the various movements of contact irrelevant to the tangent line of contact. Such movements comprise motions perpendicular to this line, known as chordal rise, and speed variation as a secondary factor due to the fact that the chain is operating at maximum and minimum radii as a result of chordal rise. These undesirable motions can be reduced by (a) use of shorter pitch chain, (b) increase in the number of teeth in the wheels, and (c) generation of contact surfaces that make it possible for the chain to enter the wheel on the tangent to the pitch circle.

The last named condition is met through the use of a generated link form developed by W. F. Brandt of the Link-Belt Co. This link practically eliminates both chordal rise and speed variation in the operation of silent chain. Definite advantages of the newer type silent chain mentioned by Mr. McAninch are:

(1) Increased smoothness on small numbers of teeth
(2) Lower noise level for equal size of chain and wheels
(3) Greater dynamic strength because of reduced contact impact
(4) Longer life because of smoother action.

These new types of silent chains

have solved various drive problems in the field.

Worm Gear Bronzes

Heat-treatable nickel-tin bronze developed by the International Nickel Co. possesses a number of characteristics making it a suitable alloy for worm gearing, it was pointed out in a paper presented by B. A. Miller of the Cramp Brass & Iron Foundries Co. One such alloy which has proved to have good foundry characteristics, strength properties and moderate cost is made up of 5 per cent tin, 5 per cent nickel, less than 0.01 per cent lead, up to about 2 per cent zinc and the balance copper. In the as-cast condition, this alloy has a tensile strength of 50,000 lb. per sq. in. and 44 per cent elongation in 2 in.

When heat treated it develops even higher physical properties. The heat treatment comprises a solution treatment or homogenizing anneal at elevated temperatures which leaves the metal, after quenching in a dead soft condition; then follows an aging treatment at 500-600 deg. F. for several hours which causes the alloy to harden. Tensile strength may be thus increased to 82,000 lb. and even higher. Obviously this metal must be produced under strict metallurgical control. Slow cooling from the homogenizing temperature is particularly necessary.

Silicon Bronzes

Another gear metal recommended by Mr. Miller is P-M-G metal, which his company produces under license of the Phelps Dodge Copper Products Corp. This metal, which has the advantage of containing no tin, is made up of 3 to 5 per cent of silicon, 1 to 3 per cent iron and the remainder copper. The iron is employed to obtain increased density and to permit the formation of small iron silicide crystals which are embedded in the softer alpha phase matrix. The grade 99 metal has a tensile strength of 45,000 to 50,000 lb. per sq. in., with an elongation of 19 to 23 per cent. This metal is less susceptible to shock than are copper-tin bronzes. It has a very narrow freezing range, which is conducive to producing a sound casting when proper gating and risering are employed in the foundry.

At the dinner meeting on Tuesday evening, U. Seth Eberhardt, president of the association and also of the Newark Gear Cutting Machine Co., introduced as guest speaker, "Dr. Charles Bartholomew, S.O.: O.M.B., president of the Liverpool Board of Trade," whose topic was "Hands Across the

(CONCLUDED ON PAGE 43)

Manufacture of Shell Discussed at A.S.M.E. Meeting

A MULTI-TOOLED lathe capable of turning out one 75 mm. per min. has been developed by a committee of the National Machine Tool Builders Association, it was revealed by Tell Berna, general manager of the association, who spoke before a special meeting on shell manufacture held at Cincinnati, Oct. 15 and 16 under the auspices of the American Society of Mechanical Engineers and the Army Ordnance Association. Test machines for each of the common sizes of shell, from 75 to 155 mm., have been built by the Studebaker Corp. The basic design of the lathe was begun last year and the details were completed this summer.

Mr. Berna said the machine tool industry had more than doubled its production in the last year and was confident it will be able to produce machine tools required for the defense program just as rapidly as plants will be ready for their installation and men ready for their operation. He referred to the present priority system as a well working method of placing orders and fixing delivery dates. Reluctance of machine tool builders to expand their capacity even faster than it has been expanded is not caused by a demand for greater profits, he insisted, explaining: "The machine tool men are not worrying about profits. They are worrying about survival of their companies. The national policy must be to conserve the capital goods industry against the day when it is needed."

Shell Turning Lathes

Analyzing various types of shell turning equipment, Lucien I. Yeomans, consulting engineer of Chicago, opposed the use of highly special purpose, multi-tooled automatic lathes, characterizing such methods of tooling as putting too many eggs in one basket. The failure of one detail of a highly complicated setup may tie up the entire production. He advocated instead the breaking up of operations into simple components and the use of simple tooling on standard machines.

The case for the multi-tooled special shell turning machine was presented by Harry Barney of the Barney Machine Co., Pittsburgh. He frankly advocated buying of standard machines where deliveries were obtainable; otherwise buy lathes specifically designed for shell production. He indicated that the B & B special automatic lathes were obtainable on comparatively short order. These machines are built extremely heavy and rigid for use with carbide tooling and are equipped with 75-hp. motors. The carriage is hydraulically fed and the rear cross slide is fed pneumatically against a positive stop. Some of the units can be equipped with vertical slides mounted on the headstock and tailstock for carrying other tools. As many as eight tools may be at work at once. Provision is made for pneumatic retraction of the tailstock to the rear so that a collet charging buggy may advance the rough forging along the lathe centerline for chucking. The basic machine may be adapted to boring, reaming and undercutting, turning the outside diameter and nose and thread milling the nose.

Special purpose shell turning lathes now in use at the Dominion Engineering Co., of Canada, were described by a representative of the United Engineering & Foundry Co. The latter concern is in possession of drawings and manufacturing rights on this lathe but is not interested in making such lathes in the United States now because of the press of other work. The design will be made available to other manufacturers, however. This machine has fully hydraulic feeds, with the tools mounted on top of the work at the rear so that the work rotates over and away from the operator.

Shell Forging Equipment

An extended analysis of shell forging equipment was given at another session by Prof. Frank Macconochie,

head of the mechanical engineering department, University of Virginia. He began by describing how shell are produced on upset types of forging machines. For a 75 mm. shell, from 80 to 100 forgings can be produced per hr. on a 4 or 5-in. upsetter, costing from $40,000 to $50,000. A somewhat larger investment is required for the combination mechanical upset and hydraulic ring drawing method. (Ed. Note: This is the Baldwin-Omes method described in THE IRON AGE, Oct. 10, p. 57).

Even greater output (240 to 290 75 mm. shell per hr.) is being obtained by the patented Witter cross roll process used in conjunction with a mechanical press. This method was described by James H. Hopkins of the Salem Engineering Co. After the billet has been partially pierced in a press, it is mounted on a mandrel and passed through a series of crossed axes hyperboloid rolls. Considerable saving in material is claimed, the comparison in blank weights for the 75 mm. shell being 16 lb. vs. 21.6 lb. for a billet to be drawn in a mechanical press. As in other forging processes, the shell made by the Witter process requires no finishing on the interior and need have an allowance of only ⅛ in. on the outside diameter for machining.

Still another method of shell forging described by Professor Macconochie is the so-called one-shot piercing method performed on the United-Dominion hydraulic shell forging press. In this machine, the billet is held in a book type split and hinged, water cooled die. Initially a lower ram pushes the billet up to the top of the die, and as the punch descends with the main ram, the metal flows sideward and downward beside and ahead of the punch tip. Cycle time for this operation is 9½ sec.

Shell Specifications

In discussing ordnance shell steel specifications, Lt. Col. M. W. Kresge, U. S. Army Ordnance Department, indicated that many factors must be compromised. The steel maker wants widely drawn specifications so as to eliminate rejected heats; the forger wants sound billets, easy to forge, with large size tolerances and excess metal allowances, while the machiner of shell wants a minimum amount of metal to remove, liberal tolerances on dimensions and hardness. The ordnance engineer's ideal is shell with a maximum percentage of fragmentation, but this is largely a laboratory product. To get a "tonnage" product, certain compromises must be made.

(CONCLUDED ON PAGE 72)

Training for Industry Featured at Tool Engineers Meeting

TRAINING of men for the metal working industry, from skilled mechanics up to tool engineers and production supervisors was the principal topic of discussion at the semi-annual meeting of the American Society of Tool Engineers, held in Cincinnati, Oct. 17 to 19. The first session on Thursday evening was devoted to this subject and at the dinner meeting on Friday night, a progress report on education and training was briefed by Herbert D. Hall, chairman of the Educational Committee of the society. The complete report was presented to the board of directors the following day.

Speaking on the importance of engineering preparedness at the first session, Frederick E. Searle, superintendent of the Ford Industrial Schools, indicated that in the past our educational system had done little to produce skilled workmen and had headed most young people toward the professions, but that the present national emergency training program gave us the needed incentive to reappraise our educational theories. The problem now is where to find workmen with sufficient skill to meet our immediate needs and those of tomorrow. Public trade and vocational schools can give beginners a splendid start in the right direction, but they are greatly handicapped in reproducing the shop conditions of industry. Schools within industry, Mr. Searle said, can command both equipment and plenty of useful work. A training program therefore has a logical place in industry.

The larger firms have been quick to recognize the feasibility of training youth even when they did not admit its necessity. Confronted as they are today, however, with the problem of securing enough men with sufficient training for present needs and future expansion, shops must establish training programs either collectively or individually. Mr. Searle believes that both the small as well as the large shop must carry on such programs. No tool shop is too small to take some high school graduates for training. In some localities, arrangements can be made with the public schools to conduct classes in mathematics and mechanical drawing, but it is usually more satisfactory to have the class work done at the shop. If the shop is small, one man can teach all the necessary class work and also supervise the shop work. One man of earnest purpose even on part time can do much to stimulate a whole group. Because of the effort to speed this training program, Mr. Searle cautioned that special emphasis should be placed on the observance of safety precautions, using printed regulations where possible.

Industrial cooperation with the schools on a college level was stressed by Dr. R. C. Gowdy, dean of the College of Engineering, University of Cincinnati, who described the cooperative plan of engineering education, begun there by the late Dean Herman Schneider in 1906. Under the cooperative plan as presently conducted at the University of Cincinnati, over a period of five years the student alternately spends eight weeks at work in industry and a similar period of concentrated classroom work at college. With this system, the machinery and methods of production are studied where they are actually in use, and practical experience is acquired collaterally with technical training so that both are given added significance by reason of their obvious and studied correlation. The college teaches the broad fundamentals of engineering and leaves specialization to the plant or in graduate work on a cooperative basis.

Industry benefits to the extent that it gets trained men (from 60 to 85

per cent of the co-op graduates at Cincinnati remain with the firms with which they worked as students). As to the student, the cooperative program aids in developing a mature point of view; it is in many cases a realistic method of vocational guidance; it affords opportunity for specialization in technique without narrowness in academic programs, and finally it gives the student a practical training which is advantageous to him both professionally and financially in placement after graduation.

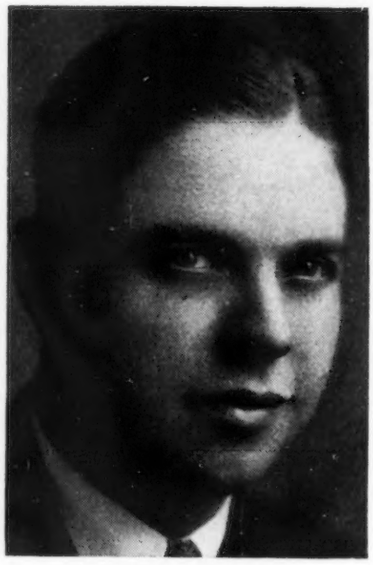
College and industry perform two separate and distinct functions in the training of the engineer, Doctor Gowdy said. Each is particularly qualified to do its part in the total educational program, but the important thing to bear in mind is the realization that the training of a young engineer must result in the integration of theory and practice, however it may be achieved, he concluded.

A complete analysis of the various training procedures in use at the plants of the Goodyear Tire & Rubber Co. was presented by W. S. Dowman, assistant director of sales and office personnel of that company. In 1913, the first so-called production squadron was set up. Men in this group are given a three year factory course, working through every production department and mastering all operations. This gave the company a group of trained men who could be thrown into any department to balance inequalities of output. Eventually the men were placed in supervisory jobs as openings occurred.

Later the plan was extended to the engineering department. The engineering squadron is given a three year machine shop course, along with related studies and is open either to journeymen mechanics or engineering college graduates, although the course for each differs somewhat. Journeymen are trained for engineering production supervision while the college men are headed toward engineering staff work. The Goodyear company also conducts a four year apprentice course which is open to high school graduates who are mechanically inclined. All three programs have been successful and there are many more applicants for enrollment in the squadrons than the number taken on each year.

Education for Industry

At the banquet on Friday night, Mr. Hall briefly reviewed some of the points covered in a lengthy report prepared by the Educational Program Advisory Committee on education and



LOUIS L. WEBER
General Chairman of the A.S.T.E. Semi-Annual Meeting

training for the metal working industry. It is expected that the report will be circulated widely after it has been modified for general publication. In his talk, Mr. Hall blamed the present school system for the lack of skilled workers, indicating that nearly 75 per cent of all youth out of school at the age of 18 are unemployable. The committee which Mr. Hall heads believes that the present high school curriculum generally does not give those students not preparing for college enough definite instruction so that they can obtain work in industry upon graduation unless they take a course in trade or vocational schools. The latter as set up today, however, are entirely too narrow in their concept, making it difficult for trade school graduates to find jobs except in their limited speciality. The committee has therefore proposed a high school curriculum that combines the best features of vocational school training with general academic work. The chief emphasis is placed on mathematics, English, shop work and drawing. A graduate from such a course would be suitable material for an apprentice course in industry, and with such a school background it would be possible to cut such a course from the usual four years to three.

In its study of apprenticeship programs, the committee has found that from 35 to 43 per cent of apprentices originally trained as machinists ultimately advance to positions in industry along tool engineering and supervisory lines. Until college courses in tool engineering are set up, the apprentice course in industry offers the best approach to tool engineering, the committee believes.

The report also covers methods of obtaining tool engineers in an emergency by upgrading or progression training of men in lower ranks. Many companies have found it possible, for example, to recruit tool designers from tool makers. Another phase of industrial training reviewed in the report is the intensive operator training programs used so widely throughout the country in connection with the national defense program.

A. H. d'Arcambal, consulting metallurgist of the Pratt & Whitney Division, Niles-Bement-Pond Co., and president of the society, in a brief address at the same banquet, indicated that this was the most successful national meeting of the society, excluding those meetings held in conjunction with tool shows. About 475 persons registered for the sessions. During the past year, the society has grown from 3700 to 5400 members and the number of chapters has been increased from 27 to 38. Mr. d'Arcambal predicted that the society would some day be the largest in the country. Stating that he was tired of hearing the machine tool industry being called the bottleneck of the defense program, the speaker pointed out that the real bottleneck was the shortage of skilled men with which to run extra shifts with existing equipment. He also stressed the fact that schools and colleges should turn out men ready to assume real jobs in industry without too much introductory training in the plant. This they are not doing today.

Comparing the conditions of the working man in Europe with those here, Whiting Williams, industrial consultant and formal dinner speaker, emphasized the fact that in the United States a worker not only seeks money and job security, which are universal goals, but also a maximum of opportunity to forge ahead. The social status, prestige and recognition that go with the job higher up the ladder are equally sought after. This sort of fluid caste system is much to be preferred to the rigid working class distinction prevalent abroad and is what he believes has made our democracy so successful. Everybody assumes he is on the way up. Mr. Williams warned, however, that recent government policies as represented by the N.L.R.B. in setting employer against employee and by industrial unions like the C.I.O. tend to level the compensation between the unskilled and

the skilled and thereby to produce a working class. The use of seniority in laying off and hiring has an equal dampening effect upon the ambitious who wish to mount a higher rung of the ladder.

Gear Finishing Symposium

Saturday morning's technical session was devoted to a symposium on the finishing of gears. Charles R. Staub, chief engineer, Michigan Tool Co., led off by describing shaving and lapping methods. The shaving process is used almost 100 per cent in the automotive field and very extensively on turbine and reduction units, he said. The tool cost per gear finished is very much lower with rack type cutters as compared with rotary cutters, but the initial tool cost is so high that the rack method is applicable only to large production runs. Case hardened gears up to a hardness of 34 Rockwell C can be shaved, and even higher with diminishing tool life. Lapping is used to correct distortion from heat treatment of hardened gears and to take off the fuzz and small ridges left on ground gears. Only a small amount of material can be removed by lapping. Mr. Staub pointed out that in trying to correct excessive errors by lapping through long cycles, the chances are that the gears will become worse rather than better, due to excessive wear on the laps. He also cautioned about the use of too much lapping compound.

Rejection of automotive gear sets in the final noise test has been reduced from 45 to 50 per cent a decade ago to less than 0.5 per cent today due to the use of shaving and lapping, it was stated by Otto H. Schafer, president of Schafer Gear Works. Gears can be finished on shaving machines in 15 per cent of the time required to finish them to equal tolerances by conventional gear cutting methods. His paper was of a practical nature and reviewed at length some of the troubles encountered in shaving work when gears reached the machine with large initial errors. He advocated placing testing equipment right at the machine for use by the operator while the shaving machine goes through its automatic cycles.

Gear Grinding

The case for grinding of gear teeth was presented by I. J. Gruenberg, chief engineer, Gear Grinding Machinery Co. He described both the formed wheel type of machine which his company makes and the generator types. Grinding of gears is resorted to in order to correct hardening errors. The method is widely used for machine

A. H. d'ARCAMBAL
President of American Society of Tool Engineers

tool gears, truck and bus transmissions and aircraft gears. On gears up to 12 in. pitch diameter, the involute contour can be ground with 0.0003 to 0.0004 in. of theoretical form and spacing errors, using an index plate and form wheel, held within 2 to 3 "tenths." In general, vitrified grinding wheels of soft to medium bond strength and 46 to 50 grit are employed in gear grinding. Wheel speeds range from 5500 to 6500 ft. per min. and work traverse about 75 ft. per min. Mr. Gruenberg recommended a soluble oil (1:80) as a coolant. Average production time per tooth is 43 sec. on general jobbing work.

Experience in the aircraft engine industry with ground gears was recited by Charles Pfeffer, in charge of gear development and production, Wright Aeronautical Corp. With weight at a minimum and specific gear loads at a maximum, for aircraft engine gears a modified tooth form of full length is used, with rounded fillets to eliminate fatigue failure. Many gears are case hardened but an even greater number are nitrided. The latter are ground first in the soft state and again after nitriding. Because the depth of penetration is only 0.025 in. in the nitrided case, only 0.003 in. of material is left on the tooth face for the second grind. Cyanided gears are also ground and both types are lapped to remove grinding fuzz. Generator types of machines are the preference for gear tooth forms, but form grinding is used in finishing involute form splines.

All aircraft engine gears are magnafluxed for internal and surface defects. Mr. Pfeffer indicated that grinding checks revealed in this test have been largely eliminated by using a special grinding oil as a lubricant instead of a soluble oil, which tends to glaze the wheel. Grinding and lapping of gears he considered an absolutely essential technique in the aircraft industry.

A feature of the meeting was the plant tours which took place all day Thursday and Friday. The following companies extended the courtesy of opening their shops to the visitors: Cincinnati Milling Machine and Cincinnati Grinders, Inc., R. K. LeBlond Machine Tool Co., Lodge & Shipley Machine Tool Co., Cincinnati Shaper Co., Carlton Machine Tool Co., Cincinnati Bickford Tool Co., Cincinnati Planer Co., G. A. Gray Co., King Machine Tool Co., American Tool Works Co., Master Electric Co., National Cash Register Co., Crosley Corp., Aluminum Industries, Formica Co., and Procter & Gamble Co. Local arrangements were under the general chairmanship of Louis L. Weber, secretary of the Lodge & Shipley Machine Tool Co.

It was announced that the annual meeting of the society and the Machine & Tool Progress Exhibition will be held in Detroit during the week of Mar. 24, 1941.

Gear Manufacturers at Skytop

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Sea." After the speaker had railled the audience with an Englishman's impressions of the United States for some time, it gradually dawned upon those present that the gentleman was spoofing them and was in fact a paid entertainer. When asked what the initials after his name stood for, he gaily replied, "son of old man Bartholomew." British papers please copy.

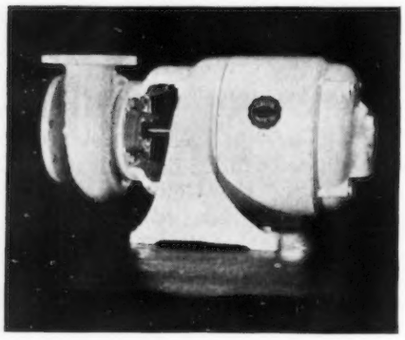
Much of the work of the meeting was confined to discussions of committees working on various standards. Several standard recommendations adopted will be announced when they go into effect after the first of the year. The gear lubrication committee, under the chairmanship of H. A. McConville, General Electric Co., presented sections 3 and 4 of industrial gear lubrication practice, relating to the lubrication of open gears. This practice was adopted. The meeting drew out the largest attendance in the history of the association, both as to gentlemen and ladies.

New Equipment . . .

General plant accessories:

Design improvements and new models of pumps, compressors, fans, unit heaters, hydraulic pipe benders, lubricating equipment, floor surfacers, valves, etc., are described in this article.

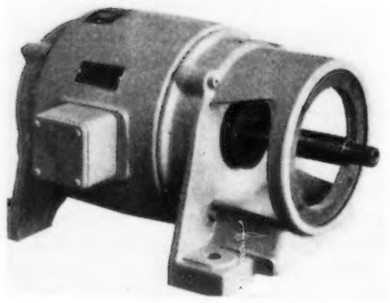
POSSIBILITY of misalinement, which often develops in connecting a horizontal centrifugal pump to its motor, is eliminated in the new pyramidal base motor developed by *U. S. Electrical Motors, Inc.*, 80 34th Street, Brooklyn. Mounting on this unit is an integral part of motor. Motor support on which pump casting is attached carries the load of the pump, instead of permitting the weight to be imposed on the shaft. There are no joints between parts which might be pulled apart by fastening the unit to an uneven surface. No coupling is required and only one shaft is used. Two



large ball bearings take all radial and thrust loads and are easily lubricated. This new design can also be used for mounting other machines where perfect alinement is essential.

Pump Mount Motor

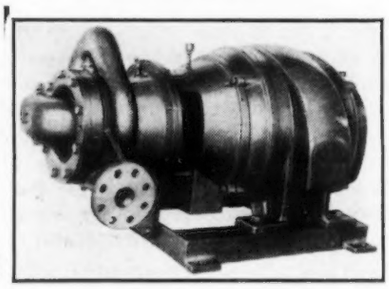
NEW line of motors with standard dimensions, designed for easy mounting of centrifugal and similar pumps, is announced by *Sterling Electric Motors, Inc.*, Telegraph Road at Atlantic Boulevard, Los Angeles. Motors are all ball bearing and are available in ratings from ½ to 50 hp. for operation on 3 phase at 2, 4 and 6 pole speeds. Extended shafts and machined



fits for pump mounting are standard throughout entire range of ratings. Large Neoprene washer on shaft between pump packing and motor bearing, in combination with a trough cast around the bearing, makes it impossible for any material being pumped to find its way into the motor bearing.

Multi-Stage Pumps

ALLIS-Chalmers Mfg. Co., Milwaukee, has extended its line of multi-stage SSUnit pumps to include a two stage pump with 4 in. suction and 2 in. discharge that can be rated up to 275 gal. a min. against heads up to 500 ft. at a speed of 3550 r.p.m. This new unit has a cast iron casing and cover, and is bronze fitted throughout. Impellers are placed back to back to provide axial balance. Unit can be supplied with either open, splash proof, totally enclosed or ex-



plosion proof motor. It is suitable as a small boiler feed pump, mine or pipe line pump, and can be used in humidifier work, air conditioning service, oil loading and for other small capacity, high pressure work.

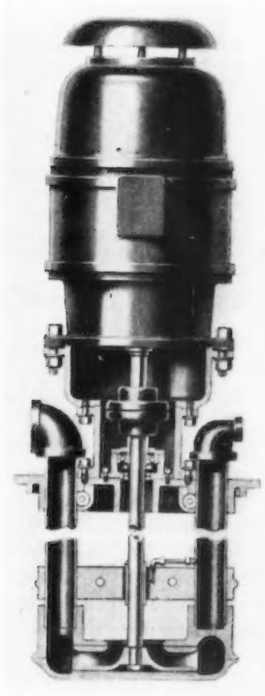
Vertical Turbine Pumps

COMPLETE redesign of its line of 6 in. medium capacity vertical turbine pumps is announced by *Pomona Pump Co.*, 574 East Commercial Street, Pomona, Cal. As a result of the new design, only 7½ hp. motor is

now required, as against 10 hp. previously, in units where a capacity of 100 gal. per min. against 110 ft. lift in a well and 50 lb. pressure above is desired. New design of impellers and seats are shown in accompanying illustration. Pumps are water lubricated, with no stuffing box below ground level. Semi-open impeller can be adjusted from the surface for wear and for changing capacity. Design of impeller vanes prevents overloading of motor regardless of changes in water level.

Corrosive Liquid Pumps

SEVERAL new types of vertical and horizontal centrifugal pumps, in sizes from ¾ to 6 in., for handling all types of abrasive mixtures and corrosive liquids are being offered by *American Manganese Steel Division, American Brake Shoe & Foundry Co.*, Chicago Heights, Ill. The new vertical shaft pump, illustrated herewith, features a reinforced plate which serves as a structural member and supports the motor, coupling, thrust bearing and housing. Strut serves as a conduit for lubricating lower bearings. Other features include an inverted intake in place of side or bottom openings to avert gas binding and to utilize hydraulic thrust to counterbalance weight of revolving parts; liberal and simple slippage seal adjustment, and split yoke bearing supports which are replaceable without dismantling. Pump parts subject to abrasion or corrosion are made in practically all commercial non-ferrous and ferrous metals.



Flexible Coupled Pump

SUPER Niagarette pumps, manufactured by *Decatur Pump Co.*, Decatur, Ill., are now available as flexible coupled units and systems. Pumps available in this design include the 240, 395 and 500 gal. per min. series. These pumps are supplied with either standard electric motor or gasoline engine and are also available as independent pumps.

Small Air Compressors

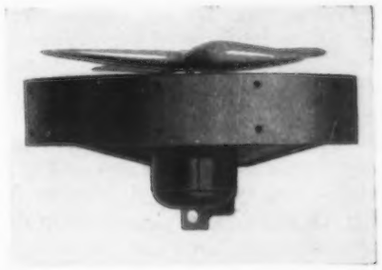
SULLIVAN MACHINERY CO. has also introduced a new series, designated as type Q, of small air compressor (not illustrated) for industrial, garage and diesel starting service. These air cooled compressors are made in single and two stage styles and range in capacity from 2.8 to 45.7 cu. ft. per min., ½ to 10 hp., with operating pressures from 100 to 200 lb. in continuous service and 150 to 500 lb. in intermittent service. Unit features copper intercooler, chromium nickel cylinders and Lynite connecting rods.

Stationary Compressors

SUITABLE for small industrial plants and for standby service, the new small stationary compressor introduced by *Sullivan Machinery Co.*, Michigan City, Ind., features a built-in aftercooler, force feed lubrication, heavy duty ball main bearings, air filter silencers on each cylinder and automatic regulation. Designated as WL-70, this two cylinder, single stage compressor is offered in five sizes from 96 to 233 cu. ft. per min. displacement, 15 to 30 hp. and air pressures of 30 to 125 lb.

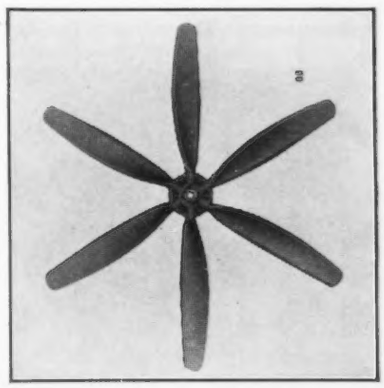
Ventilating Fans

RECOMMENDED for use where it is necessary to increase air removal in gravity type ventilators, or where wind velocity is not sufficient to ventilate building, the new roof ventilating power fans developed by *Truflo Fan Co.*, 531 Main Street, Harmony, Pa., are mounted in steel bands. These fans are available in 48, 42, 36, 30, 24 and 18 in. sizes with exhausting capacities ranging from 40,000 to 2000 cu. ft. per min. Propellers are made of cast aluminum and motors can be had in open, totally enclosed non-fan cooled, totally enclosed fan cooled and explosion proof types.



Propeller Fans

THE line of propeller type fans manufactured by *Hertzell Propeller Fan Co.*, Piqua, Ohio, has been extended and a number of new features developed. Fans are now available in single propeller, two propeller and multi-blade types. New mounting styles developed include an extension shaft, a new belt drive blower, belt drive exhaust fan and a slow tip speed fan. The improved adjustable pitch fan, illustrated, is especially suitable for cooling towers and mine ventilation. Greater economy in power consumption is claimed for the new design of this fan.



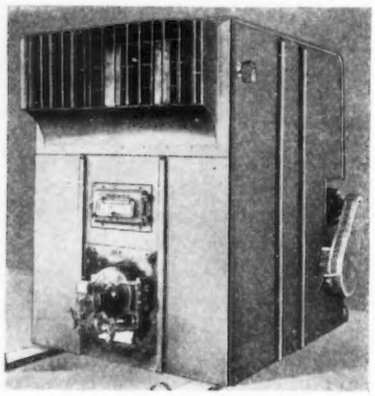
Vertical Unit Heaters

FEATURING adjustable radial outlet vanes, the new vertical unit heater offered by *American Blower Corp.*, 600 Russell Street, Detroit, can be mounted with equal effectiveness on ceilings of high, medium or low rooms. This feature makes it possible to either direct the heated air downwards in a fast moving concentrated stream so that it will carry great distances in high ceiling rooms, or to flatten the air flow horizontally to produce a wider cone of air to heat med-

ium or low ceiling rooms. Heater contains a circular type heating element with cast bronze steam and return header and copper tubing with fins. Heaters are rated for sound to enable a user to select a unit that will be sufficiently quiet for any given application. Twelve sizes are made ranging from 30,000 to 600,000 B.t.u.

Oil Fired Unit Heaters

DIRECTHERM unit heaters, manufactured by *Airtherm Mfg. Co.*, 720 South Spring Avenue, St. Louis, are now available with oil burning units. The oil unit has been



developed to meet the particular requirements of direct firing wherein the heat of combustion is immediately converted to actual heating purposes. Directherm heaters, made in six sizes from 300,000 to 1,500,000 B.t.u., are self contained systems featuring high efficiency of combustion chambers, comparatively low outlet temperatures, and a horizontal high velocity air steam with an adjustable wide angle of delivery. Heaters can also be arranged for gas or coal firing.

Hydraulic Pipe Bender

ESPECIALLY suited for pipe bending work, the new motor driven hydraulic pump announced by *Blackhawk Mfg. Co.*, Milwaukee, weighs only 32 lb. and develops 10,000 lb. per sq. in. hydraulic pressure. The pump is portable and can be controlled

by a hand or foot. Bending unit illustrated will handle pipe and conduit ranging from 1 to 4 in. This hydraulic pump, powered by a ½-hp. motor, can also be used with company's line of rams which are made in capacities from 4 to 50 tons.

Unit Air Cleaners

UNIT type air cleaners for use on grinding machines, abrasive cutoffs, polishing and broaching equipment, or wherever fine particles of dust are released into the air, have been developed by *Antrim-Nyman Co.*, 1555 Taylor Avenue, N. W., Grand Rapids, Mich. Inlet opening of unit is connected to wheel hood of machine by means of flexible hose or pipe and dust-laden air is drawn into an oil pan holding one gallon of oil. Part of this oil is forced upward to provide a film covering for a series of baffles. Major portion of dust is trapped in the pan, while finer particles are collected on self-cleaning baffles. Clean air is returned to the room. Fan is placed on clean air side of unit to give

it longer life. Occasional emptying of oil pan is only attention required. Unit illustrated has a capacity of 435 cu. ft. per min. and a velocity of 5000 ft. a min.

Superfinishing Valves

SUPERFINISHING of valve seats and disks in the 500 Brinell line of valves manufactured by *Hancock Valve Division, Manning, Maxwell & Moore, Inc.*, Bridgeport, Conn., is said to give an increase in life of 12 times that of the same disks and seats not so finished. The longer effective life is said to be largely due to fact that superfinishing almost completely eliminates friction.

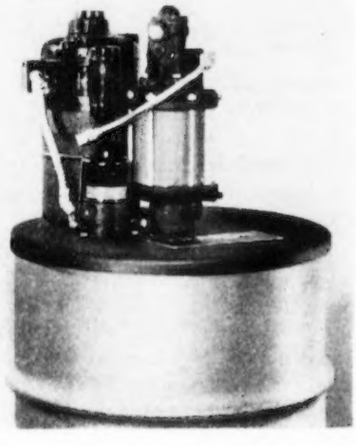
Portable Pipe Machine

EQUIPPED with a new sliding, floating type die head which is adjustable and quick opening, the new No. 502 Pipe Master pipe machine announced by *Oster Mfg. Co.*, 2057 East 61st Place, Cleveland, can handle nip-

ples as short as 3½ in. in the 2-in. size machine without use of special nipple chuck. Including this new unit, company's line of pipe machines now range from ¼ to 2 in. Cone fluted reamer mounted on front of die head and integral with it is said to enable operator to handle close work easily and efficiently. To assist front gripping chuck in centering longer lengths of pipe, machine is equipped with a three-jaw centering chuck at rear of spindle.

Hydraulic Grease Pump

CAPABLE of handling tacky and heavier greases than are customarily dispensed by either portable or stationary grease pumps, the new hydraulically operated barrel pump introduced by *Trabon Engineering Co.*, 1814 East 40th Street, Cleveland, is built in six models with pressures ranging from 1500 to 5000 lb. Motor and all moving parts are totally enclosed and are mounted on a drum cover which fits all standard 400-lb. drums. A.c. or d.c. operation is available.



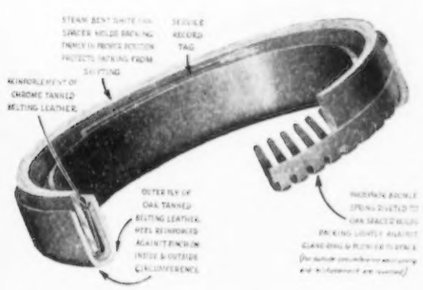
Leak Stopping Material

DEVELOPMENT of a new active ingredient for use in Flextite, a leak-stopping material, to bring its activity down to a matter of seconds instead of minutes as heretofore, is announced by *Flexrock Co.*, 23rd

and Manning Streets, Philadelphia. This improved Flextite is used with ordinary Portland cement, forced against water pressure and held there a few seconds until the leak is stopped (see accompanying illustrations). This material is especially valuable for stopping leaks in drums, retaining walls, dykes, concrete tanks, etc.

Hydraulic Packing

IMPROVED reinforced hydraulic U packing in section sizes from ¼ to 1¼ in., for any plunger diameter from 9 to 90 in., is now being made by *Wayne Davis Packings, Inc.*, 325 West Huron Street, Chicago. Wear wall and heel of this packing are doubly reinforced against wear on the plunger and gland ring. Packing can be reinforced with



any adaptable material over the U packing base. Standard reinforcement is chrome tanned belting leather backed by oak tanned belting leather. Patented phosphor bronze spring spacer maintains light pressure against inside of bevelled contact lip, insuring a primary seal until packing lips can be set to plunger surface under pressure so as to carry seal to the packing heel.

Vacuum Cleaner

ELECTRIC VACUUM CLEANER CO., INC., Cleveland, has perfected two new industrial vacuum cleaners. Model 184 has a capacity of two bushels, and Model 184-A 1½ bushels. These cleaners are streamlined for easy portability and storage and are operated by 1-hp. motors.

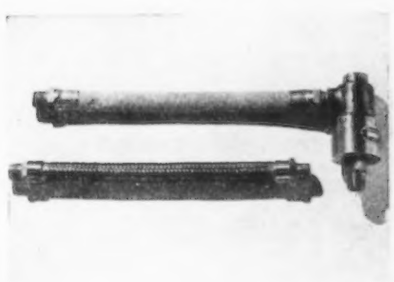
Sewer Cleaning Machines

ELECTRIC sewer and pipe cleaning machines, capable of removing stoppages several hundred feet from the sewer or pipe opening even when it is necessary to pass through elbows and traps, are offered by *Oster Mfg. Co.*, 2057 East 61st Place, Cleveland. Revolving different types and stiffnesses of coiled wire snakes with various augers and cutting tools at-

tached, machines are said to be effective in cutting through roots, rags, grease, chips, cinders, etc. A gripping chuck revolves the snakes eccentrically, transmitting a whip to the tool working in the pipe line. V-belt drives prevent overstraining of snakes when heavy obstructions are hit. Units are powered by ½-hp. motors.

Rotary Union

AN improved rotary union for use wherever a gas or liquid line must be connected to a revolving shaft, roll or drum is being marketed by *Perfecting Service Corp.*, 2622 South Parkway, Chicago. The union features low friction performance and is especially designed for web driven rollers. Standard unions for use on water and steam up to 50 lb. pressure, and heavy duty unions for use where pressures exceed 50 lb. are available.



Lubricated Plug Valve

DEVELOPMENT of a lubricated plug valve capable of handling a working pressure of 7500 lb. is announced by *Merco Nordstrom Valve Co.*, 400 Lexington Avenue, Pittsburgh. Valve is made of special alloy steel, and both plug and interior contact surfaces are hard faced. Extremely heavy flanges and side walls are incorporated to prevent distortion. The hard facing on this and other valves manufactured by the company is called Merchrome. This coating is said to enable the valves to handle services when temperature as high as 1000 deg. F. are encountered. In the Merchrome coating process, an alloy with high hardness and corrosion resistance characteristics is welded to the rotating surfaces and bodies of the valves. The hardness of this coating is about 54 Rockwell C, and this hardness is said to be maintained practically unimpaired at 1000 deg. F. Corrosion resistance of the coating is approximately equal to stainless steel.

Low Pressure Grease Gun

A NEW low pressure volume delivery grease gun, designated as Model 6697-A, is offered by *Alemite Division, Stewart-Warner Corp.*, Chicago. Gun has a capacity of 25 lb.

and pumps about 1 cu. in. of grease per stroke. Maximum pressure when operated by hand is 3000 lb., and 5000 lb. when operated by foot. It is equipped with a 7-ft. hose and delivers 1 oz. of lubricant every three strokes. Weight of gun is 39 lb.

On The Assembly Line

BY W. F. SHERMAN
Detroit Editor

• Automobile industry subordinates 1942 tool requirements to arms needs . . . Changes, though fewer, will be forthcoming . . . Sales good at start of 1941 selling, and production is at all-time autumn high . . . Export markets topsy-turvy in first year of war

DETROIT—The big news this week was the formal action taken by the Automobile Manufacturers Association to subordinate tool and die changes to whatever priority may be required by the defense program.

Understood to have acted at the direct request of President Roosevelt, the motor car makers pledged themselves, in effect, to utilize no more of the facilities and manpower of the tool and die industry than were left over after arms requirements. And, judging from William S. Knudsen's remarks that all such capacity will be required in 1941, the left-over portion may be small indeed.

Clarification will be shed on this situation next Friday (Oct. 25) when representatives of the automobile, aviation and tool and die companies meet at Detroit with Mr. Knudsen. It is expected that a fairly comprehensive plan will be drawn for allocation of aviation engine preparatory work, and allotment of tool and die facilities and manpower may be put into preliminary stage.

However, this does not by any means point to a changeless model year in 1942. There are a pair of factors working against this—one, the fact that the defense tool and die program will not swing into high speed until after the first of the year, perhaps not before spring; and, two, the fact that there will still be skilled help available to the automobile makers in their repair rooms, where workers who fix production machinery utilize their spare time—estimated at 75 per cent of their hours at work—producing new equipment.

Retooling May Be Started Soon

SOME sources foresaw this week the possibility that as a result of the A.M.A. pledge on subordination of changeover requirements, retooling programs of the automobile companies might start in the very near future. Thus the present ample supply of manpower could be used while it is available, and the tools and dies thus created could be held against the changeover nine or ten months from now.

There was general agreement that the changes for 1942, as the situation appears now, would be definitely moderate. But as has been proved many times before, the genius of stylists, designers and production men may well be able to metamorphose minor modifications of production equipment into appearances of widespread variation.

Meanwhile there is general satisfaction over the way 1941 model sales are starting off. The reports from the shows which took place last week, while not good from the standpoint of attendance gain, are shot through with gratification at business done on the floors. Reports on sales for the first 10 days of October, too, reflect important advance and in the instances of many companies the deliveries are keeping parallel pace with the swelling volume of production.

And production is high—probably higher than ever before at the initial stage of a model year. The past week saw produced, according to Ward's Reports, Inc., some 114,672 cars and trucks—highest since last December and far ahead of the comparative 1939 figure of 70,114. Some further advance may still be expected, although the crest of the wave is nearly at hand.

But the wave has been high enough to propel October output to a level around 475,000 trucks and cars. Momentum appears powerful enough, too, to carry November at an average rate of 100,000 units a week or better, and put the final quarter of this year in territory well above 1,200,000 vehicles, perhaps 1,300,000. In 1939 a new all-time fourth quarter record was set at 1,162,348.

Large Stocks Being Built Up

SUCH volume can hardly help but pile up field stocks in the face of a normally receding market as the winter months come in. The thesis might be advanced that manufacturers are building big stocks now as a hedge against any possible slowdown of assembly operations later, perhaps because of priorities that might develop or because of material shortages. Neither of these factors is looked for today, but admittedly "anything might happen anytime."

In the meantime, the long-range attention of the automobile industry, like every industry, focuses on the war and its effects. One of the most interesting outshoots of the present thinking relates to the general export situation of the automobile companies as it has been shaped by the war.

The upheaval in American markets abroad for automotive products since the war began is well-nigh unbelievable. When figures on August shipments were published a few days ago, rounding out the statistics of one full year of war, the conclusions could be developed for the first time, and they are indeed remarkable.

For instance: It can be logically figured that the direct losses in exports of the American automobile industry in the first full year of war amount to $95,200,000—representing approximately 139,000 cars and trucks, which, in turn, represent more than 140,000

"Drill ye Tarriers, Drill!"

That old song always reminds us of a Vertical Turret Lathe, because the two sledge swingers working together are a little like the way the vertical and side heads of a Vertical Turret Lathe operate at the same time on a chucked part.

This thoroughly sound principle has been brought to its finest development in the Bullard Vertical Turret Lathe, long recognized as a standard machine tool for many types of work by the railroads, by the motor industry, by numberless miscellaneous manufacturers and most recently by the aircraft industry—whose demands for heavy metal cutting ability and sustained accuracy are the most exacting ever known.

Bullard Vertical Turret Lathes are made in 24", 36", 42", 54" capacities. The illustration shows a 36" High-Speed model machining an aeroplane motor crankcase.

tons of steel and more than 10,000 tons of cast iron

Such a conclusion develops out of statistics and normal expectancy. In the 12 months preceding the start of the war, up to Sept. 1, 1939, there were exported 156,682 passenger cars valued at $95,636,-718, and 119,574 trucks valued at $72,857,825.

In the first year of the war these figures came to 99,120 passenger cars valued at $61,655,487 (a 35.53 per cent decline in dollar volume) and 101,957 trucks valued at $75,-154,542 (a 3.15 per cent advance in dollar volume, though units lowered).

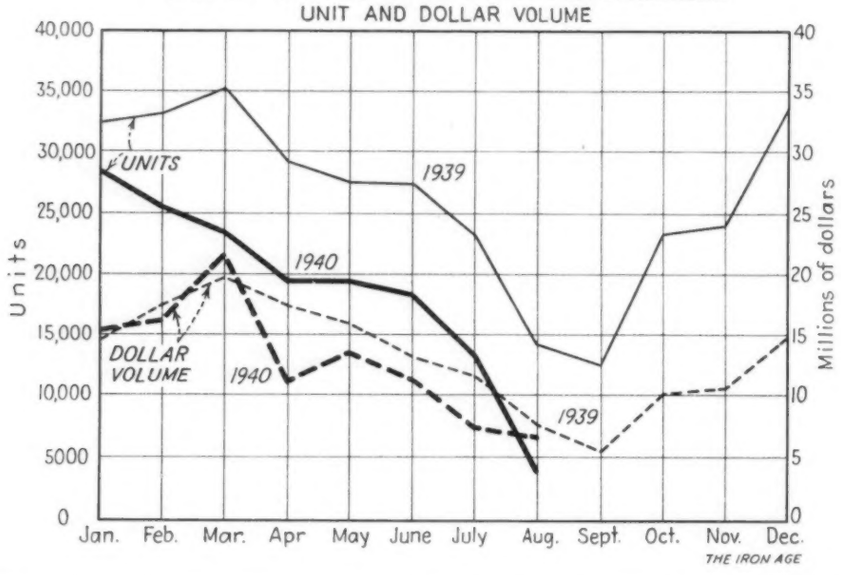
In the same period, however, domestic business advanced some 23.2 per cent. Had exports increased in the same proportion, which is normal to expect, then there would have been shipped abroad some 340,000 vehicles, instead of the 201,077 actually exported. Dollar volume would have run around $231,200,000, rather than the actual figure of $136,-810,029.

Further research develops the facts that truck exports in this war period are mainly to nations at war or expecting to be at war, and that passenger car exports are concentrated mainly in the Western hemisphere.

Of the 10 countries taking the most trucks in the first year of war, seven were identified with the fighting—France, Canada, South Africa, India, Belgium, Finland and Egypt. In the year before the war, France, Belgium, Finland and Egypt were not in this "first 10."

The reverse is the rule for passenger cars. In the year preceding the war, the 10 most important countries of car destination included South Africa, Canada, Belgium, Australia, the United Kingdom and Egypt. This group of countries was shrunk in the first year of fighting to Canada, South Africa and Australia.

In the meantime, the first year of war, from Sept. 1, 1939, to Aug. 31, 1940, saw among the top 10 passenger car purchasing nations seven in the Western Hemisphere—Canada, Argentina, Mexico, Brazil, Venezuela, Colombia and Cuba. This is an unprecedented consolidation of markets.



Truck Exports Expanded

Incidentally, as a final word on this subject, it is of high interest to note that truck exports rose abnormally in every case thus far where the orbit of war was to extend a few months later. Finland purchased large numbers of trucks immediately before invasion of Finland, and Sweden was also a heavy purchaser at this time—apparently fearful of involvement also.

Then later, in the midwinter months, Belgium and Holland began to purchase trucks in much greater quantity than usual, foretelling the overrunning of the Low Countries last spring. Going back into the records, a similar situation can be found two years ago for Czechoslovakia, prior to that country's absorption by Germany.

Today, the records show, heavy midsummer exports have gone forward to Jugoslavia. Heavy early summer exports to the Dutch East Indies were notable, but they tapered off in midsummer. Exports to all parts of Africa are much heavier than usual. It may be interesting to recall these facts later on.

The war, already responsible for huge truck ordering by our own government, appears to be developing more of the same. Washington advices this week were that some 78,000 more trucks, to cost around $175,000,000, would be ordered. As reported in the Assembly Line of Oct. 8, there was placed in the third quarter about $150,000,000 in orders, or 25 per cent of a normal year's business for the companies involved, and quite enough to overload their order banks for a long time ahead.

Averaging of per-truck cost to nearly $2,245 on the basis of the Washington figures would indicate that forthcoming orders would be distributed insofar as size and type is concerned just about as were preceding orders. Perhaps there will be slightly greater emphasis on smaller vehicles than on the special-type, large-size jobs, but again the lowering of average cost may be due in part to normally higher initial costs on original ordering.

↓ ↓

Detroit

• • • **The Army is seeking** agreements with Buick and Studebaker for manufacture of **Pratt & Whitney** airplane motors, Defense Commissioner William S. Knudsen reported last week. Mr. Knudsen, warning against spiraling prices, told 1200 Detroit industrialists at an Economic Club meeting, that $314,000,000 of defense contracts had been let in the Detroit area, that $150,000,000 more of such orders probably would be placed here.

Experience

MUST HAVE *Two* DIMENSIONS

ENGINEERING EXPERIENCE, to be of greatest value to the iron and steel industry, must be *wide* as well as *long*. Length can be measured in *years*... but scope can only be measured by the variety of projects on which that experience was acquired.

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This broad scope of practical experience puts McKee engineers in a position to give you valuable help in planning your construction program.

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Washington

BY L. W. MOFFETT
Washington Editor

• End wasteful spending or change our form of government . . . No other path remains for winner of the Presidential election . . . On Roosevelt's side are many of the 30 million persons receiving government checks

WASHINGTON — There is going to be a change in either the fiscal policy or the form of the United States Government, no matter what November election returns are. Deficit upon deficit cannot continue much longer in a free republic. Bankruptcy, if not already here, will be inevitable. That leads to some form of totalitarianism, the very thing that the people are being told this country stands ready to fight against with its fullest strength, if threatened from abroad. Therefore it is incongruous that the greater threat is of a home-made variety of government dictatorship. Yet that is the situation.

If an administration is powerless or does not want to encourage private enterprise and year in and year out federal expenditures exceed income, then private enterprise will have to fold up and the government will have to take over and establish a regimented state. Strange things have happened in this country the past seven years. But it is seriously doubted that, despite the nostrums it has submitted to, the country as a whole would long endure with easy tolerance a one-man government. Swinging from a republic to totalitarianism is quite different from changing from a monarchial government to another kind of authoritarian state such as has been witnessed in Europe.

Nevertheless there will have to be a halt in this Santa Claus business, its politics and its operations to gain and retain power, or a profound change in government is certain.

Has Never Seen a Balanced Budget

DEFINITELY the third term candidate for President gives no hope whatsoever that he is capable of administering or if he can he does not desire to administer except by prodigious spending, free-for-all subsidies, and handouts. Never during his almost eight long years as President has Mr. Roosevelt seen a balanced budget and even without the intrusion of the national defense, the deficits were growing and taxes rising. The defense program rightly will demand still greater taxes. The difficulty is that no attempt is made to economize in the many ways that it could be done. The President treats costs and their implications with glib indifference. Indeed the impression given is that he takes a delight in widening the spread between outgo and income. This seems to be a fixed New Deal policy and there are many who suspect that it is a studied policy with complete government control as its objective. This is an entire reversal of what appeared to be the policy of the Administration's "first 100 days." During that period economy and maintenance of private institutions seemed to be gone.

Then something not yet altogether clear happened. The brain trust got busy. The New Deal spending motives now have a forbidding aspect. It is necessary to point out, however, that regardless of political party, there is an urge for spending. Its lure has become infectious. There is much talk by anti-New Dealers in Congress about economy, and many of them apparently are sincere, but it is noticeable that a large number grab all the money they can for their own districts. The purpose is to gain reelection, of course. They complain about WPA and with good reason, but they are against a cut in WPA payrolls if the reduction affects their districts. They go along also in farm benefits and whatnot, without regard to their justification or degree.

Mr. Willkie has also gone along on continuing relief and farm payments but the difference between Mr. Roosevelt and Mr. Willkie is that Mr. Willkie preaches a live philosophy. The New Deal preaches a dead philosophy. There are no more frontiers, so it says. Our economy has reached full bloom and is fading, the country is told. Private enterprise, it is declared, has come to an end. The inference of government control is clear. Mr. Willkie sees industry in its comparative infancy, ready, under encouragement, to expand endlessly. He preaches production and more production, jobs and more jobs. This growth in private enterprise clearly would take off the government much of the load of relief, handouts, subsidies and other forms of drain on the Treasury and the taxpayers. And of equal importance it would take from the politicians of all parties the chance to cash in on Government largesse.

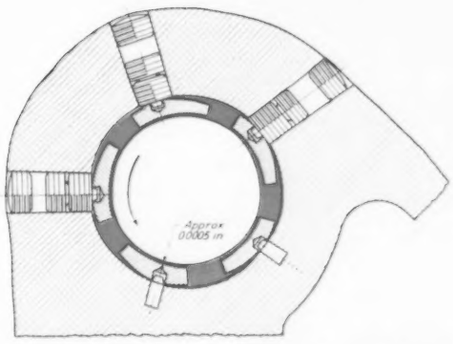
The New Deal's perpetuation in power is easy to understand when one considers the unending and tremendous raids it has made on the Federal Treasury since it took office. It is now distributing about 10,000,000 federal checks. It has been estimated that at least 30,000,000 people—probably a great many more—are direct beneficiaries from the Federal Treasury. This is about 23 per cent of the country's population. There are a lot of votes in this number. Not all will be for Santa Claus but certainly a great many, probably a majority, are not expected to impeach him.

1,100,000 Government Jobholders

THE New Deal has increased the civil payroll to an all-time peak, 1,100,000 jobholders, many mere parasites who are boondoggling or engaged in business

ALL *Cincinnati* GRINDING MACHINES

RUN ON FILMATIC BEARINGS



The FILMATIC principle. Self-adjusting shoes produce independent, converging oil films which develop high radial pressures, forcing spindle into central position.

FILMATIC bearing construction is fully protected by U. S. and Foreign patents

AND THE SPINDLES ARE *Superfinished*

TO LESS THAN ONE MICRO-INCH

The hidden things that you can't see or feel are the ones that make CINCINNATI Grinding Machines such consistent cost reducers, month after month without interruption. For example, many painstaking operations are required to produce CINCINNATI grinding wheel spindles. Now, another operation has been added; they're superfinished on the bearing diameters to a surface quality of less than one micro-inch.

The superfinishing operation materially adds to the already amazing performance of Filmatic bearings . . . an exclusive spindle bearing construction for all CINCINNATI Grinding Machines. To mention only two advantages—load carrying capacity steps up, as does life-span of the bearings. Publication G-446 gives you the whole story of Filmatic. Write for your copy today.

CINCINNATI

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED

Manufacturers of

Tool Room and Manufacturing Milling Machines
Surface Broaching Machines Centertype Grinding Machines Cutter Sharpening Machines
Centerless Grinding Machines Centerless Lapping Machines

harassing activities. Their payroll is about $2,000,000,000 a year. There were 572,091 on the civil payroll when the New Deal took over. So an insatiable bureaucracy has seen an addition of 527,909 so-called workers. These remarks are not intended in any way as a reflection on the scores of thousands of Government employees who are engaged in intelligent, constructive effort such as is necessary to keep the complicated Federal machinery going.

There are 1,800,000 WPA workers, some altogether deserving and getting only a pittance of their just desserts. Others are political hangers on.

CCC has 300,000 and is an outstanding organization of real accomplishment among the many New Deal establishments.

National Youth Administration has 679,544 in its doubtful embrace.

Federal checks are going to about 6,000,000 farmers, whose payments now are at the rate of approximately $1,573,000,000 compared with 1933 payments of $152,000,000.

The present farm payments are almost identical with expenditures this year for relief, NYA and relief work. In 1933 these expenditures were about $337,000,000.

All Federal expenditures this year aggregated $9,666,000,000, an increase of more than $4,500,000 over 1933.

Unemployment still stands around 8,000,000, despite the number now engaged on national defense work.

Public Works expenditures now are about $950,000,000, an increase in excess of $500,000,000 over 1933.

It seems inconceivable that an Administration with this miserable record would have the presumption to ask that it be perpetuated in power, a power many fear will mean an attempt to change our form of government.

↓ ↓

Washington

• • • **In a move to** encourage employee training programs aimed at developing skilled workers, the Labor Department's wage-hour division has relaxed its policy by announcing that attendance at such training classes hereafter will not be considered as working time requiring compensation by the employer.

Attendance, however, must be voluntary on the part of employees and the wage-hour division regards no program as voluntary if a condition of the employee's continued employment is attendance at the training classes. The employee must not produce any goods or perform productive work during such training periods, the course must be given outside of regular working hours and the intent must be to train the workers in new or additional skill as distinguished from merely making him more efficient in his present job.

↓ ↓

Washington

• • • **Appointed recently,** a four-man technologic committee on tin smelting has begun work here of reviewing eight proposals for the building of a tin smelter in this country as a part of the preparedness program and to recommend the selection of one of them. The committee was selected by E. R. Stettinius, Jr., head of the Industrial Materials Division, National Defense Advisory Commission, and by the Metals Reserve Co., a subsidiary of the Reconstruction Finance Corp. The members of the committee are: Clyde Williams, director, Battelle Memorial Institute, Columbus, Ohio, chairman; Walter C. Smith, metallurgist, Cerro de Pasco Copper Corp., New York; John F. Thompson, executive vice-president, International Nickel Co., Inc., New York; F. W. Willard, president, Nassau Smelting & Refining Co., New York.

↓ ↓

Washington

• • • **A program of aircraft** standardization extending to gun calibers, parts and other phases of aircraft construction is to be worked out by joint efforts of American and British representatives. A four man informal committee named by President Roosevelt includes Secretary of War Stimson, Secretary of Navy Knox, Defense Commissioner Knudsen and Treasury Secretary Morgenthau.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

I BROUGHT A SOCK AN' NEEDLES TO DEMONSTRATE BETTER-- NOW TH' HOUSE-WIFE SITS KNITTIN' LIKE THIS, AN' A BOMBER SOARS OVER AN' SHE MERELY LOOKS INTO TH' ADJUSTABLE SIGHTER, PRESSES TH' LITTLE LEVER, AN' DOWN COMES MISTER BOMBER! TH' BOSS SAID HE'D TAKE A LOOK AT IT WHEN HE'S THROUGH EATIN'
HE'S GOT IT COVERED UP SO NOBODY CAN STEAL HIS IDEA-- I THINK HE'S A NUT!
NO, NOT QUITE! HALF OF HIS IDEA IS VERY BRIGHT, TH' PART ABOUT TH' HOUSE-WIFE -- IF YOU CAN GET ONE IN EVERY KITCHEN, THINK OF IT!
COPR. 1940 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
THE PROFITEER
J.R WILLIAMS 10-25

Announced Sept. 3rd—Thousands already in Use!

Industry rapidly adopts—

NEW...CARBOLOY STANDARD TOOLS FOR "UNIVERSAL" SHOP USE ON 80% OF ALL TURNING, BORING, FACING JOBS!

Detroit, Sept. 3.—Mass production on a standardized line of Carboloy tools, designed to cover 80 per cent of all applications for cemented carbide tools, was announced by Carboloy Company, Inc., today.

The introduction of this simplified line of tools—comprising but five styles in three different grades—together with the economies resulting from mass production, has made it possible to price these complete tools well below comparable tools in the past, a typical new 'standard' tool, Style 4, now priced at only $1.85, comparing with tools previously costing $5.84 in lots of one. In quantities of 50 or more this typical tool now costs only $.90.

The program that has made this unprecedented step possible has been under development for the past three years. In the period from 1929 to 1937 prices of Carboloy cemented carbide

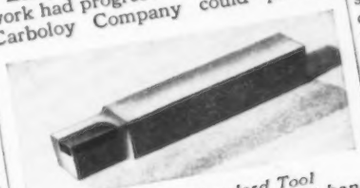
Style No. 1—Standard Tool
Available in 9 sizes

were progressively reduced four times as the result of economies resulting from increased consumption. About that time it became apparent that to widen the scope of useability of Carboloy tools required a complete revision of the principles under which such tools had been produced and sold up to then. What was needed was mass production of complete carbide tools on a scale never before attempted in this country.

Since 1937 extensive research work in the laboratory and in the field has been devoted to determining the fewest number of 'grades' of Carboloy and the simplest line of tools that would meet the vast majority of all carbide tool applications.

New $1,000,000 Plant Part of Program

Early in 1938 this development work had progressed to a point where Carboloy Company could proceed



Style No. 4—Standard Tool
Available in 9 sizes, left and right hand

with its next step—the expenditure of a million dollars on a new plant and equipment to expand and concentrate manufacturing activities. This plant, completed in the spring of 1939, was designed with a production capacity of ten times the amount of cemented carbide then consumed by industry, with provisions for expanding metal production to many times that amount.

Since that time, research and field experimental work has resulted in reducing the number of grades of Carboloy required for the vast majority of applications to only three —one new grade for steel cutting, and two for cast iron. Further, it was found that five styles of tools in each of these grades would cover 80 to 90 per cent of all turning, boring and facing applications.

The basic design of these tools is

Style No. 13—Standard Tool
Available in 5 sizes, left and right hand

such that several hundred variations can be rapidly ground in the tools by the user to meet special requirements. With the fast, simple grinding procedure developed during the past five years and now widely used by industry, such tool changes can be rapidly and economically accomplished. This rapid grinding procedure, plus the fact that the price of these new standard tools is comparable to that of many ordinary tools, brings to the field of Carboloy tool use a flexibility that permits broad 'universal' use of these tools within the average shop on short job-lot work as well as production runs.

The new standardized tools are carried in stock, ready for shipment, completely ground and ready for use. An extremely valuable feature is the incorporation of a ground-in chip breaker on all standard tools designed for the machining of steel, at no additional charge.

The new program, according to the announcement, is anticipated to produce a wider scale use of carbide tools, thereby reducing the cost of production of basic cemented carbides to [illegible] that in spite of higher [illegible]ost.

Carboloy Announces 6th Price R[illegible]

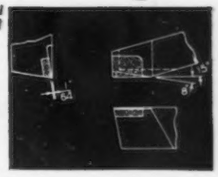
Since the year when Carboloy tools were first introduced it has been the [illegible] Carboloy Co[illegible]

For a number o[illegible] have realized tha[illegible] reducing the p[illegible]

- ✓ LOW PRICED! *(Check against any other cutting tools)*
- ✓ SIMPLIFIED ORDERING!
- ✓ SIMPLIFIED TOOL STOCKS!
- ✓ IMMEDIATE SHIPMENT!
- ✓ YOU GET THEM ALL GROUND READY FOR USE!

(Steel cutting tools furnished with ground-in chip breaker)

Example of chip breaker ground in steel cutting tools.



Have You the Facts?

WRITE FOR CATALOG GT-125

CARBOLOY COMPANY, INC.

11153 E. 8 MILE ST., DETROIT, MICH.

Chicago • Cleveland • Newark • Pittsburgh • Philadelphia • Worcester, Mass. • Los Angeles

Canadian Distributor: Canadian General Electric Company, Ltd., Toronto

CARBOLOY

REG. U. S. PAT. OFFICE

TANTALUM CARBIDES
TITANIUM CARBIDES
TUNGSTEN CARBIDES

Fatigue Cracks

BY A.H.DIX

Big Cigar Man Bats .500

• • • Your Detroit eyes and ears, Bill ("On the Assembly Line," see page 48) Sherman, lunched the other day with Barney Oldfield, famous automobile racer of your salad days. Bill asked Barney the difference between a "gilhooley" and a "wingding."

A "gilhooley," Barney explained, is a sort of a spin. He said the name originated at a race on the board track at Sheepshead Bay some 35 years ago. The assumption is that a Mr. Gilhooley invented it. But Barney flunked "wingding." All he could offer was the vague impression that maybe it had something to do with motorcycle racing, and if you are an old motorcycle racer or if anyone in the Indian or Harley-Davidson plant sees this will he please relieve our anguish.

He Tops Our Boast

• • • Our recent blurb on the high grade headlines in the "News of Industry" (see page 58) moves Jos. S. Thompson, San Francisco, to send in what is in his opinion the all-time headline high. The *San Francisco Call* copy desk wrote it at the time Gene Tunney refused to be bossed by Tex Rickard and flew to New York for a fight with Jack Dempsey. The headline was:

Gene Defies Tex Ban On Hop to Bout

Not bad, but no better than our favorite which was in your f.f.j. a couple of months ago, *"Can Opener Fails, C-I Men Cut Tin Pot from Child's Head."*

Ex Cathedra

• • • The urge to sermonize hits us so hard every once in a while that we can't resist, and this is one of the times. Blame it on a note from one of our advertising men. He says someone he called on the other day asked, *"Why should we advertise now when we have all the business we can handle?"*

Even though our enormous bias disqualifies us as a fair commentator we feel moved to mutter that even though a plant be running 24 hours a day, if salesmen have been pulled in and advertising has been cancelled, *rigor mortis* has already set in. But it won't show until the inevitable day when there won't be enough business to run the plant 16 hours a day, or even eight.

When that day comes the firm that has absented itself from your ken finds its place usurped by those who have kept themselves before your eyes. The passage to the limbo of forgotten things is dismayingly brief, and usually it is a one-way trip.

But this great truth probably isn't worth the space, considering that trade papers invariably get fat in good times and skinny in times when orders are needed most.

Fish and Game Note

• • • The Oct. 3 item on plurals interested us, but we still do not know, when buying a tailor's goose, how to order two of them.
—C. E. Henny, Exec. Engr., The Trumbull Electric Mfg. Co., Plainville, Conn.

We always write, *"Send us a tailor's goose. And while you are at it, better send two."* Piscatorial plurals bother us most. We know about tunas and porgies, but never know what to do about pike, trout, perch, mackerel and shrimp.

Squawk From the North

• • • One of your 18 readers will be off your list if deliveries of Iron Age do not improve. Issues reach me two to three weeks after publication date . . . Let the World's Greatest Industrial Paper beat the breast and bemoan some more, and make it a good beating and loud mbans!
—A. S. Robertson, The Safety Car Heating & Lighting Co., Montreal.

Apologies to Mr. Robertson and to your favorite family journal's other 616 Canadian subscribers for delayed delivery of recent issues. Reason was our mishandling of the War Exchange Tax, causing the withholding of copies at Canadian customs offices. The trouble has now been eliminated and normal deliveries were resumed with last week's issue. According to the foreign phrase section of our drugstore dictionary a good way to end this is *mea culpa, mea maxima culpa.*

Just Under the Wire

• • • We thought Roosevelt lost the purist vote the other night when he pronounced *decadent* deck'-a-dent. Our little dictionary gives de-kay'-dent as the sole pronunciation, but the big one in the brains department, where it isn't needed, allows deck'-a-dent as a secondary pronunciation.

What we would like to know how to pronounce is That Man's name. We've heard it pronounced *roos-felt, roos-velt, rooz-felt, rooz-velt, roos-a-felt, rooz-a-velt, roze-felt, roze-velt, roze-a-felt, roze-a-velt, rose-felt, rose-velt, rose-a-felt,* and *rose-a-velt.*

Ouscuse Please

• • • A couple of weeks ago we had an item about Mr. Couse and Mr. House of the Couse Laboratories, Newark, N. J., both coming from Touse, New Mexico.

Maynard L. (*Oil & Gas Journal*) Durham reports that there isn't any Touse in New Mexico. It is Taos. We always thought that was *tay-ose*, and have been saying it that way ever since we read *"Lady Chatterley's Lover,"* written by T. E. Lawrence, who with Messrs. Couse and Housé put Taos on our map. Sorry. Anyway, it sounded like *Touse* when our man heard it.

He Read Double, Saw Single

• • • We had the pleasure the other day of shaking the hand of our favorite scientist, General Motors' Charles F. Kettering. He was on the receiving line at the General Motors preview in the Waldorf-Astoria. Frank J. Oliver, our machine tool editor, took us along. He had two passes, both made out in his name.

The man who called out the names in the best Court of St. James manner gave Frank a 21-decibel salute but when he started on our card, which was also inscribed "Frank J. Oliver," his voice broke. He looked at Frank to see if we were twins, and seeing his mustache and full head of hair, decided to give us a bye.

We recalled that a few months ago your f.f.j. had reported Dr. Kettering as saying:

"Every line of endeavor . . . has its unfinished business. Take a few simple examples of physics. What is friction? Why is glass transparent? . . ."

So we were going to wisecrack, *"Glass is transparent because you can see through it,"* but there were a thousand people lined up in back of us, and he looked kind of tired of smiling for an hour straight, with another hour or so to go, so we just went on in and asked an attendant, "Which way to the DeSotos?".

Puzzle

• • • Last week's problem about dive bomber is still over our head, and we are waiting for one of the master minds to crack it. If they find it too easy they can throw in a 50-mile crosswind.

This one just came in over the telephone. The solution in 30 minutes will get you a silver star on your math card:

A fence 4 ft. high is 4 ft. out from a building wall. A ladder 20 ft. long leans against the wall so that it touches the top of the fence. At what point above the ground does the ladder touch the building and how far from the building is the foot of the ladder?

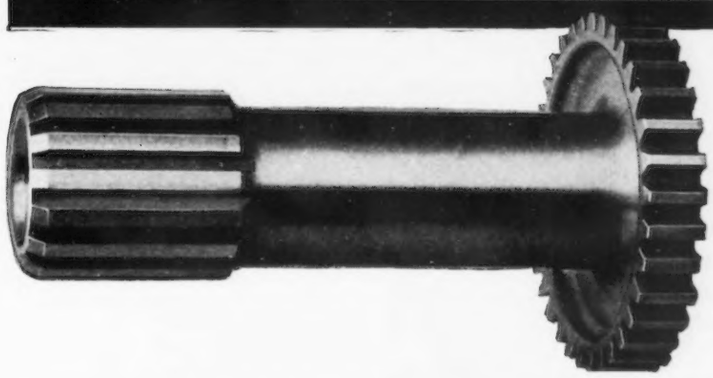
Adding NICKEL TO GEAR STEELS

1—IMPROVES *mechanical properties*
2—SIMPLIFIES *fabricating problems*

PERMISSIBLE COMPRESSIVE STRESSES ON ENGAGED GEAR TEETH

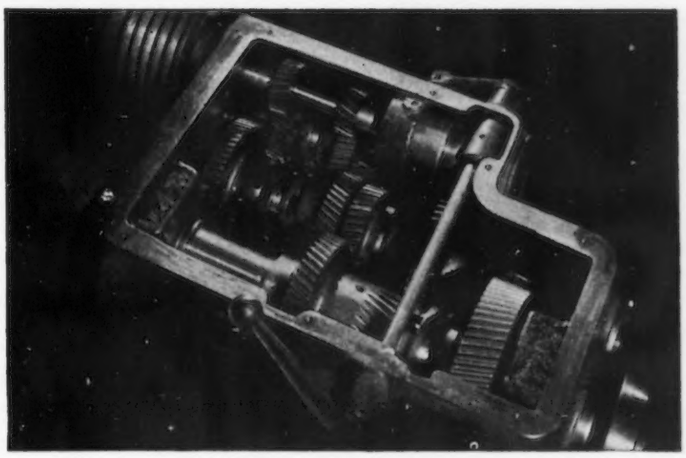
TYPE	NICKEL ALLOY STEELS S.A.E. Classification	PERMISSIBLE COMPRESSIVE STRESS*
Direct Hardening	3150, 4640, 4650, etc.	170,000 lb./sq. in.
Carburizing	3115, 3120	180,000 lb./sq. in.
Carburizing	2315, 2320, 4615, 4620	200,000 lb./sq. in.
Carburizing	3312, 4815, 4820, 2515	215,000 lb./sq. in.

*Compressive stresses calculated from Hertz formula. These values are for intermittently loaded gears and should be reduced 20/25% for constant mesh loading.



Choosing the most suitable gear steel depends upon getting mechanical properties to safely meet service requirements. But of equal importance are fabricating properties ...uniform response to heat treatment with minimum distortion and freedom from cracking, plus *economical machining.* Today's higher speeds and heavier tooth loadings emphasize the advantages of specifying direct hardening and carburizing gear steels alloyed with Nickel...Nickel alone or in combination.

Hollow quill shaft with integral gear and splines, pictured at left, must be resilient to absorb torque of 500 HP Ranger aircraft engine. To maintain tooth contours and resist fatigue stresses this vital shaft is forged from 3½% Nickel, 1½% chromium steel, SAE 3340.



Strong, tough and wear-resistant, headstock gears in Monarch lathes are 3½% Nickel steel, SAE 2350.

JUST PUBLISHED

"Modern Trends in Nickel Steel and Cast Iron Gear Materials," a paper presented before the American Gear Manufacturers Association 22nd semi-annual meeting. For your copy of this 16-page illustrated booklet, or for personal answers to your gear problems, please address:

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

News of Industry . . .

Britain May Require Less Imported Scrap

London

A comprehensive national survey to record all the larger sources of potential scrap metal in the United Kingdom has been announced by Herbert Morrison, Minister of Supply. The survey will cover every condemned bridge and derelict building, every abandoned mine and quarry. It will include disused steel towers, mine and railroad tracks and every large structure now no longer in use but which, because it contains valuable iron and steel, would yield scrap metal.

The use of such scrap, which is known to exist in large quantities, will make more ship tonnage available for the import of foodstuffs and finished products needed to conduct the war effort. As this scrap is made use of, more and more of Britain's heavy imports will be in the nature of finished and semi-finished products, which will lessen the pressure on British mills and factories.

At the time of writing, scrap, semi-manufactured and finished steel all continue to be imported in large quantities, but the progress of the efforts at domestic scrap collection have been so encouraging as to suggest that imports may be on a lower scale in the future.

Colorado F. & I. Will Not Make Shells Until 1941

The Colorado Fuel & Iron Corp., Denver, Colo., which recently received a large shell contract from the U. S. Army, will not begin to make shells until some time next year, Arthur Roeder, chairman of the board told stockholders at their annual meeting last week.

As the company's rail mill was shut down during most of September, the company's results for the third quarter were not favorable, Mr. Roeder said. The company's prospects over the remainder of the year will be about on an average with recent years, he added. While the company's export business has improved since the outbreak of war, profits on its export orders were said to be less than on domestic orders. However, the margin on domestic orders has been reduced by higher costs.

LET'S PRODUCE MORE!—Wendell L. Willkie (below Mrs. Willkie), in recent campaign speeches has emphasized more and more that U. S. industry must be unshackled so it can (1) build for defense, and (2) restore jobs and profits. Willkie is against "state socialism."

Canada Will Build Alloy Steel Plant

Ottawa, Ont.

A plant costing $5,500,000 to be erected in southern Ontario will increase the Canadian output of special alloy steels by thousands of tons monthly.

Canadian productive capacity of these special steels is being increased to keep step with the enlarged Canadian armament program. Production of the new plant will be utilized in the manufacture of gun barrels, moving parts of artillery equipment, and in other types of military equipment where alloy steels are essential. The new plant will be in operation in 1941 well before the present armament program reaches its peak production.

The addition of this new plant to the others being erected for the Department of Munitions and Supply brings to $235,000,000 the capital commitments made by the Dominion government for plant construction to meet war needs.

Federal Register to Publicize Big Contracts

Washington

• • • **The War and Navy** Departments, in a move to provide a public record for government agencies and other interested parties, hereafter will publish in the Federal Register a summary of the important terms of all defense contracts which total $1,000,000 or more.

The Federal Register, official government publication for federal administrative orders, will publicize this information on contracts:

Name and address of contractor; brief description of the work provided the information is not considered detrimental to national security; total consideration or cost of the work; adjustments, changes, options, etc.; termination and conditions of settlement; liquidated damages, etc.

Conemaugh Iron Works Sold to Kulka Co.

• • • **Kulka Iron & Metal** Co., Alliance, Ohio, has purchased the Conemaugh Iron Works, Blairsville, Pa., according to an announcement by Ralph Gessler, attorney for the Conemaugh company's bondholders. The new owners plan to leave the buildings and necessary maintenance machinery intact but will sell surplus machinery, scrap iron and other property included in the purchase.

Westinghouse Draftees Get Month's Extra Pay

East Pittsburgh, Pa.

• • • **Employees with** the Westinghouse Electric & Mfg. Co. for one year or more will receive a month's pay if they are called to military service, under, and in accordance with, the provisions of the Selective Service and Training Act of 1940. Those eligible for vacations will receive vacation payments in addition to a month's earnings. All such employees will be granted a 12-month leave of absence, whether they are conscripted or volunteer for one year's service under the national defense program. Other privileges will be given draftees.

J. & L. Employees Entering Army Will Get Back Jobs

Pittsburgh

• • • **Jones & Laughlin Steel** Corp. employees will be fully protected in job restoration and seniority rights under a policy applying to employees drafted into military service, announced last week by the company.

The SWOC was notified of the company's actions which have been under consideration for at least a month. Vacation allowances will be given to those employees who are eligible for it at the time of entering training and who have not received such vacations. Employees participating in training will be on special leave of absence for a period not to exceed one year and application for reinstatement must be made by employees within 40 days after release from training.

Group insurance may be reinstated upon reemployment of the employee or the latter may continue to pay the regular monthly premium during the period of special leave. Seniority and pension details have also been covered in the announcement made to all employees.

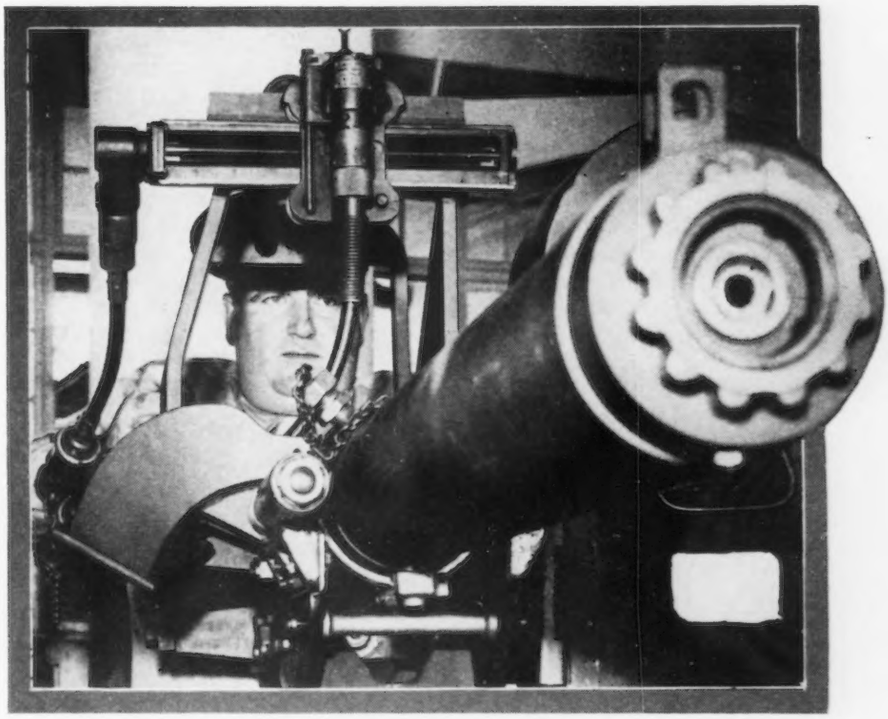


Photo by International

DEFENSE AGAINST bombing: This is a .50 M-2 anti-aircraft gun, one of the most modern and efficient guns being made for any army. The photograph was taken at the Rock Island Arsenal, Rock Island, Ill.

Coming Events

Oct. 21 to 25—National Metal Congress, Cleveland.

Oct. 24 to 25—National Machine Tool Builders Association, semi-annual convention, Chicago.

Oct. 25 to 26—Foundry Equipment Manufacturers Association, annual meeting, Hot Springs, Va.

Oct. 31 to Nov. 2—Society of Automotive Engineers, national aircraft production meeting and exhibition, Los Angeles.

Defense Board Plans Warehousing Program

Washington

• • • **In an effort aimed** at preventing a recurrence of World War transportation tie-ups when freight cars were used for storage, the National Defense Advisory Commission has planned a "coordinated warehousing program" under which the government may have to undertake the construction of its own facilities.

A survey of all available warehouse facilities is under way by the defense commission's transportation division, which will work with the Army and Navy and other government agencies in warehousing products for the defense program. Defense Commissioner Ralph Budd, head of the transportation division, reported that under the projected plan existing space will be utilized first, after which other suitable buildings will be used. If storage space still proves inadequate, the government may have to undertake warehouse construction, Mr. Budd said.

Molding and Patternmaking Contest Sponsored by A.F.A.

• • • **The Apprentice Training** Committee of American Foundrymen's Association is sponsoring competitions in molding and patternmaking for 1941. These contests, started in 1924, have been successful in building up interest in organized trade training. Some 140 foundries and pattern shops had apprentices competing in the 1940 contest.

The 1941 competitions will be held in four classes: gray iron molding, steel molding, non-ferrous molding and patternmaking. First, second and third prizes of $30, $20, and $10 respectively will be awarded the winners in each of the four classes. Final judging will take place at the 1941 Convention.

The committee in charge of the competitions is under the chairmanship of S. M. Brah, International Correspondence Schools, Chicago. Other members of the committee are: Frank C. Cech, Cleveland Trade School, Cleveland; H. L. Charlson, American Steel Foundries, East Chicago; J. G. Goldie, Cleveland Trade School, Cleveland; J. Morgan Johnson, Tri-City Manufacturers Association, Moline, Ill., and C. W. Wade, Caterpillar Tractor Co., Peoria, Ill.

Any regularly indentured apprentice is eligible to compete. Local contests to select entries for the national competition may be conducted by either individual companies or groups. Copies of the regulations governing these contests may be had from the Apprentice Training Committee, American Foundrymen's Association, 222 W. Adams St., Chicago.

An Assist! By ATLAS

View at Prominent Iron Foundry

To Lower Costs!

Here Atlas - designed, Atlas - built equipment moves heavy scrap and other charging materials with consummate ease.

Monorail deposits empty bucket on roller conveyor. Bucket *rolls down* to scale platform, is charged with iron, weight read from yard crane cab. Scale platform lowers, turns, bucket *rolls down* to monorail for pick-up and charge to cupola.

A propitious circle, presaging profit at the year-end—and a definitely typical Atlas installation.

THE ATLAS CAR & MFG. CO.

Engineers CLEVELAND, OHIO *Manufacturers*

serving the world with mobile handling equipment

Air Hygiene Foundation Meeting for Nov. 12-13

Pittsburgh

• • • **Prof. Philip Drinker,** Harvard, will head a symposium here highlighting health safeguards in the mining, mechanical and chemical industries which bear the brunt of preparedness production, at the fifth annual meeting of the Air Hygiene Foundation to be held at Mellon Institute, Nov. 12 and 13.

Capt. Ernest W. Brown, senior medical officer, Brooklyn Navy Yard, will talk on "Industrial Hygiene and the Navy in National Defense"; Dr. P. A. Neal, National Institute of Health, will discuss "The U. S. Public Health Service in the Defense Program"; Dr. H. W. Haggard, Yale University, will cover "Noxious Gases"; Dr. Carey P. McCord, Detroit, director, Industrial Health Conservancy Laboratories, will talk on "Health Protection in Electric Welding"; L. Metcalfe Walling, administrator, Division of Public Contracts, U. S. Labor Department, will outline health requirements on government contracts under the Walsh-Healey Act; and William P. Yant, research director, Mine Safety Appliances Co., Pittsburgh, will talk on the protection of civilians in war time, especially from dangerous gases.

KEEL OF THE 45,000-ton battleship "New Jersey" was laid recently at the Philadelphia Navy Yard. Charles Edison, former Secretary of the Navy, is pictured welding the first two plates.

Defense Traffic Alone to Require 25,396 Cars Weekly

• • • **The U. S.** preparedness program, including raw materials and finished products in the next two years, and material for obtaining camp construction and supplies including food, clothing, arms, ammunition and all other materials for 3,000,000 soldiers, will involve an average rail movement of about 25,396 carloads a week or about 4 per cent of the average weekly carloadings in 1939, M. J. Gormley said recently in New York at the annual meeting of the Association of Marine Terminal Operators. Mr. Gormley, who is executive assistant, Association of American Railroads, said that the railroads can handle without difficulty any possible traffic increase.

Ward Walcott Heads Amalgamated Union

Pittsburgh

• • • **Ward Walcott,** Granite City, Ill., has recently been elected international president of the Amalgamated Association of Iron, Steel and Tin Workers and will assume new duties Jan. 1, 1941. He succeeds B. Frank Bennett, who served as president since Jan. 1 when he took the place of the late Mike Tighe, who was president for many years. William Grey was elected international vice-president, having been assistant secretary-treasurer. Lewis Leonard was reelected international secretary-treasurer.

U. S. LUBRIFLUSH
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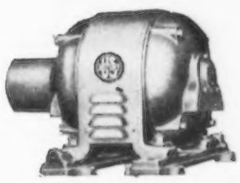
Motor Bearings
GUN
THE NEW WAY
U. S. Lubriflush method cleanses bearing of old, devitalized lubricant by forcing new lubricant through bearing.
THE OLD WAY
No way is provided for purging the bearing of old, devitalized lubricant. New lubricant merely passes by the bearing.
Patent Pending
Removable plug for draining

Most advanced method of thoroughly cleansing bearings



Here indeed is a revolutionary improvement in the lubrication of motor bearings. U. S. Lubriflush allows new lubricant to be introduced to the innermost recesses of the bearing, forcing the old, worn-out lubricant from the bearing and out of the motor through a bottom drain. The bearing is purged of sludgy, devitalized grease, and renewed with clean lubricant. Bearing life is greatly increased. The U. S. Lubriflush system eliminates the necessity of disassembling the bearing to cleanse it. No extra charge is made for Lubriflush if specified on your order.

SEND FOR BULLETIN

An interesting Bulletin describing the new U. S. Lubriflush system in comparison with ordinary motor bearing lubrication will be mailed on request. Mail the coupon.

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Midland Steel Products Workers Get Increase

Cleveland

• • • **After about two days'** absence, striking employees of the Midland Steel Products Co., maker of automobile frames, returned to work Oct. 11, having accepted wage increases ranging from 3 to 10c. per hr., and an increase in vacation pay from 40 to 45c. per hr. Longer rest periods for the assembly line and a revision in seniority regulations based upon union dues paying, were reported to be among other provisions of the settlement. James F. Dewey and D. T. Roadley represented the United States Department of Labor in the negotiations. The company supplies frames for Hudson, Studebaker and Buick among other companies.

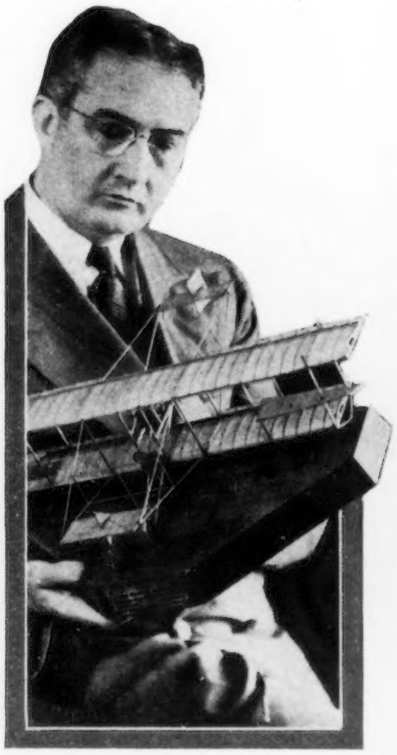

Photo by International

NEW MARTIN BOMBERS: Glenn L. Martin, above, president of the aircraft company bearing his name, has been awarded the Daniel Guggenheim medal for 1940. Mr. Martin, holding a model of a plane he learned to fly in 1909, is now working on two new bombing planes said to be the largest aircraft of their kind.

Two More Aircraft Plants Will Be Built

Washington

• • • **Contracts totaling** $2,642,708 for aircraft plant expansion were awarded by the War Department last week to two companies under the provisions of the newly-developed emergency plant facility contract.

A $1,023,200 plant will be constructed by the Bell Aircraft Corp. at Wheatfield Township, Niagara County, New York, and a $1,619,508 plant will be built by Beech Aircraft Corp., at Wichita, Kan. In each case the company will furnish funds for construction but under the contract the government will repay the cost of plant expansion over a five-year period.

UNWIELDY LOADS EASILY HANDLED

It's easy to pick up awkward loads and move them directly to destination with a Cleveland Tramrail overhead materials handling system.

In the metal-working shop illustrated, electric hoists do the heavy lifting, and the light work of propelling the bridges and carriers is done by hand. The Tramrail cranes provide complete coverage for the entire storage room. Easily damaged sheets are handled with speed and safety.

Whatever your requirements, from the simplest hand-propelled equipment to an extensive electrified system, Cleveland Tramrail can serve you.

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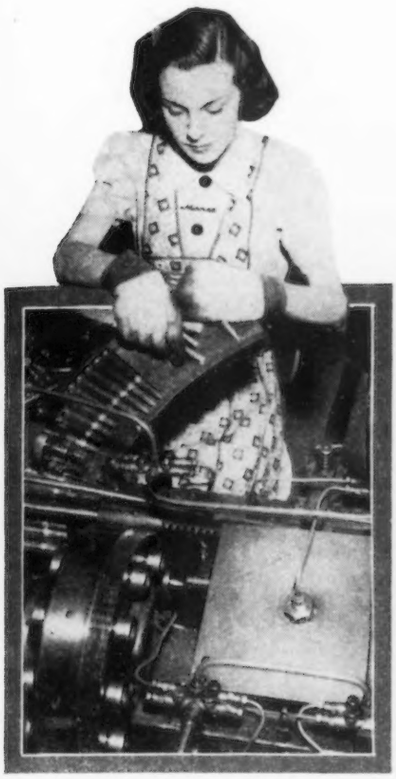


Photo by International

GAUGING CARTRIDGES: Women employees like this are working in arsenals throughout the country as the national defense program gains momentum. This girl, at Frankford Arsenal, Philadelphia, is guiding .50 cal. cartridges into a machine that gauges and weighs them.

McKeesport Tin, J. & L. Deal Involved $3,000,000

• • • **McKeesport Tin Plate** Corp., which recently sold its tin plate division to Jones & Laughlin Steel Corp. for $3,000,000, will change its name to National Can Corp. and will concentrate its activities in can manufacturing, with plants at Maspeth, N. Y., Baltimore, and Hamilton, Ohio, George F. Doriot, McKeesport president, has told stockholders.

National Can Corp. has agreed not to engage for 10 years in manufacture or sale of tin plate or the tinning of black plate anywhere in the United States, five states excepted, and has agreed for a period of years to buy from J. & L. most of its requirements of tin, terne and black plate at the generally accepted market price, these materials to remain competitive as to quality and price.

Barringer To Address Scrap Chapter Meetings

• • • **Chapter meetings** of the Institute of Scrap Iron and Steel Inc., scheduled for the near future, include Northwest chapter at Minneapolis, Oct. 22; St. Louis chapter at St. Louis, Oct. 24; Seaboard chapter at Baltimore, Nov. 3; New Jersey chapter at Newark, Nov. 7. These meetings will be addressed by Edwin C. Barringer, executive secretary of the national Institute.

Mr. Barringer also will address Milwaukee scrap dealers at a luncheon on Oct. 23, and with members of the Chicago chapter will participate in the dinner honoring the 50th anniversary of Joseph E. Michaels, of the Hyman-Michaels Co., Chicago, in the scrap trade.

STAINLESS gets its wings!

• Yes, for more and more aircraft applications, ARMCO Stainless Steels are winning their "wings." Stainless makes possible light, strong, rigid sections. This way both commercial and military planes can have greater fuel capacity, longer cruising range.

You'll find ARMCO Stainless is easy to fabricate by the fast spot-weld process. This means rapid production at lower cost . . . smooth plane surfaces . . . less drag . . . higher speeds. And ARMCO Stainless for exhaust stacks and collector rings resists hot, corrosive gases, cuts maintenance costs, assures longer airworthy life.

Why not streamline *your* skybirds with ARMCO Stainless? Try this strong, corrosion-resisting metal for wings, fuselage, collector rings, exhaust manifolds, engine cowlings, floats, hulls and wing faring. Or what products for home or industry would you like to make better of stainless? The American Rolling Mill Company, 300 Curtis St., Middletown, Ohio.

ARMCO STAINLESS STEELS

Post-War Crash Can Be Avoided, A. G. Bryant Says

• • • **More creative and** efficient selling technique will help the machine tool industry to meet conditions developing after the war's end, A. G. Bryant declared Oct. 22 in an address before the annual convention of Associated Machine Tool Dealers of America at Dayton, Ohio. Mr. Bryant, president of the Bryant Machinery & Engineering Co., Chicago, said he challenges the philosophy that "utter collapse and complete cessation of normal activities" will be the aftermath of the war. His address, "Selling For Delivery In 1950," follows:

"The subject of this message may be startling even to the salesmen of an industry who have become accustomed recently to prolonged deliveries and have been required to specify the year as well as the month when making promises of shipment.

"It seems strange, except to those who were active in business during the first World War, to be in the position of having to apologize to a source of supply for securing an order in its behalf. It seems now to be a far cry to those desolate days from 1932 to 1936 when the entire industry would be shaken by a mere whisper that any customer was about to consider the purchase of more than one machine of any size or type.

"To a fairly normal industrial demand that was developing during the first half of 1939 there has come in the past fourteen months the impact of war needs for production machinery not equalled before in our history. Great as were the requirements during the era of the first World War, the multiplication of mechanized units in present day military, naval and air activities has created unheard-of demands for the machinery of production.

"As every thinking executive in our industry must realize, the situation is far from desirable. The plentitude of orders does not necessarily represent substantial profits and the concentration of production efforts in the building of mechanisms intended solely for destruction cannot in the end benefit commerce or our own branch of industry. There is an old and very significant saying that 'it does no man any good to see his neighbor's house burn down.'

"There is one unadulterated blessing derived from the present picture, however, in which we in our industry may obtain particular satisfaction. For once, there have been stilled the voices of the ignorant, the visionary and the demagogue, who, especially since the collapse in 1929 have been shouting from the house tops that our economic ills were traceable to the dislocations caused by so-called "technological unemployment". No longer are there suggestions in Congress or from the "soap boxes" of radio or newspapers that production machinery should be limited for fear of its displacement of human help. The emphasis is now for more and better machinery for greater and more intensive production. How queer it is that many times great truths are demonstrated most convincingly only at a time when people are put to great danger or are up against utter necessity.

"What about selling for delivery in 1950? Are we seriously thinking of making shipments that far ahead? No, it is not likely that even the hysteria that sweeps great movements onward to untold heights may go so far as to encourage industry to commit itself in 1940, 1941 or 1942 for facilities needed in 1950.

"This does not mean, however, that we are not justified in thinking about the deliveries that we hope to make from our industry in 1950 regardless of at what later date the orders may be taken. No business needs to give more attention at the present time to its possible status a decade hence than does the vital, but small, and little understood machine tool industry.

"Publicity given to machine tools and to their vital place in the present emergency has brought the industry into a prominence and public recognition never before received. Yet, even among men who have devoted their lives to work in this field, there is considerable lack of knowledge as to the relative size and the irregular habits of the machine tool business.

"Basically, the volume of the industry is small but even more striking is the way in which the annual sales violently fluctuate. The National Machine Tool Builders' Association has given a splendid statistical service to its members and is authority for the figures from which we have drawn the following deductions and comparisons.

"Normally, the entire industry employs a total of only about fifty thousand men, has an investment of only about 150 millions and averages a sales volume annually of only 100 millions. Consider, therefore, the peaks and valleys that have occurred in this industry during the twenty years since the first World War. They make a cross section of the Rocky Mountains look in comparison to be as level as a Kansas wheat field.

"In 1919, the industry's production totaled 212 millions. Two years later in 1921, production dropped approximately 90 per cent to a total of about 23 millions. Again we reached a peak in 1929 at 185 millions and thereafter dropped in 1932 to 22 millions. Consider also that by 1929 and 1932 dollar values of machine tools had substantially increased over the period ten years previous

Defense Board Gets Data on Tool Exports

Washington

• • • While the National Defense Advisory Commission was compiling information this week from manufacturers on machine tools affected by the new law authorizing their requisitioning when "on order" for foreign buyers, Col. R. L. Maxwell, administrator of export control, said that there will be "few if any occasions when it will be necessary to resort to requisition." Many owners or agents, he said, will feel that a transfer of title to the government will be to the owner's advantage.

so that the drop in actual orders was even greater than the production figures indicate.

"Note further that the figures given represent totals for each year. It is known that maximum production in 1929, for example, was maintained for only a few months and that therefore the rate of sale and of manufacture at the high point was very much higher than the total for the year would indicate. The same applies to the depth reached in 1932 and the early part of 1933 when sales and production almost ceased. As a matter of fact, it is very clear that there was a decline in the industry's rate of sales and production from the peak in 1929 to the valley in 1932-33 of at least 95 per cent.

"We have yet to find another essential industry that experienced so devastating a drop.

"Now, in 1937 improved industrial conditions in this country and increased foreign demand brought total production to 185 millions and in 1939 additional foreign demand brought the volume to 200 millions.

"It is now estimated that shipments for 1940 will approximate 400 millions and for 1941 500 millions.

"We have pointed out previously that one of the really remarkable facts about both manufacturers and dealers in the machine tool industry is their *extremely bad* life expectancy and their *extremely remarkable* low mortality.

"What can we do *now* to steady the flow of business in our field, to avoid some of the periods of desperate illness that our industry has sustained in the past? Is it not time to be thinking about what deliveries we shall make in 1950?

"If in 1919 a little more farseeing thought had been given to what the situation would be a decade later, it may have been that some of the holocaust of 1929 could have been avoided. If during the despair of 1931 to 1936 we could have visualized the mounting developments leading to our present crisis, what a difference it might have made in our own fortunes and more especially in the welfare and safety and the destiny of the Nation.

"If we are wise enough now to look a little to the future, we may be able to guide our own efforts at present and in the next few years so that in 1950 we may have a better opportunity to deliver machines that will serve society and that will make for our own prosperity. To go blindly forward during this unprecedented period may cause us to have reactions in 1950 as devastating as those we experienced in 1921 and in 1932.

"It is commonplace these days to hear in otherwise responsible quarters prophecies of utter collapse and complete cessation of normal activities in the aftermath of the War. Such a philosophy and such a prophecy we challenge.

"The world has gone through a succession of crises throughout the centuries and one fact is unmistakable in this whole course of events. That is, that we have always moved forward to even higher standards of living, of significant social developments, of invention and of production for human needs.

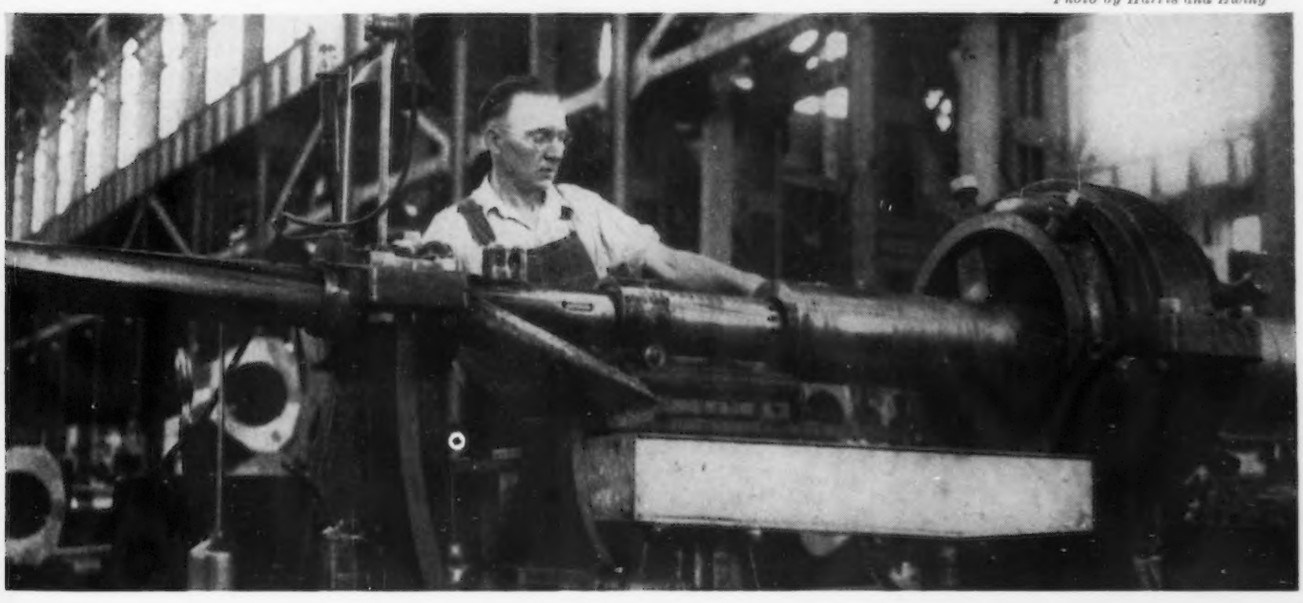
"It is not humanly possible with the intensity of effort at the present moment to concentrate much of our energies on definite plans for 1950. It is possible, however, for us to govern our present efforts with a sensible appreciation of the future so that what we do at the present time may not need to be redone at great effort at a time when we can ill afford it.

"There are a few simple rules by which we can now be guided which will not greatly affect our present earnest efforts to serve our country and to manage our businesses but which may have a most profound effect on what we are going to deliver in 1950.

"In 1950, as they did in 1940 and 1930 and 1920, people are going to want new things and will strive to get them. It is ridiculous to assume that because of the

MORE NAVY GUNS: Big guns for the Navy ship production program are being rushed to completion at the Washington Navy Yard. The picture was taken at the naval gun factory.

Photo by Harris and Ewing



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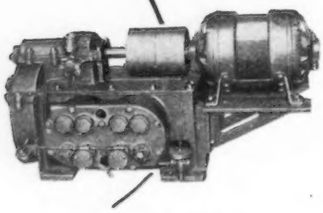

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reactions of the present war. human beings are going to be content to revert to conditions of generations past or that they will be satisfied with anything less than better standards of living.

"This means that the machine tool industry to maintain its place in society and for its own preservation must create new machines to manufacture new necessities. The machines that are today the acme of perfection for turning, drilling, milling and shaping the armaments, the automobiles, the radios and the refrigerators of 1940 are going to be passe for the creation of the new productions that society will invent and demand for 1950.

"By that time we must stop selling the machines that make the covered wagons of today and start selling the machines that will produce the super streamliners of transportation, of household facilities, and of business equipment of tomorrow.

"New machine tools must be created and produced and some who are engaged only in the selling branch of our industry may feel that this does not concern them, that this is solely the job of the manufacturers. To such let us say that this job must be done by the cooperation of all.

"The selling personnel of our industry is unique in many ways and one of the big problems of the selling organization is to maintain its personnel with capable talent just as a present crucial problem of the machine tool manufacturer is to expand his production force with capable and experienced men.

"Mere order taking has no place in the machine tool business. Some industries are especially burdened with the type of sales organization that depends merely upon inquiries received through advertising or as a result of the initiative of customers. That is not typical of the modern machine tool selling organization and it cannot exist at all in the future.

"It has been pointed out that throughout general business 70 per cent of all sales are initiated by purchasers themselves and that of the remaining 30 per cent of all goods actually sold through the initiative of a sales organization, a large percentage is effected by only 20 per cent of the salesmen. This contrasts with the condition in the machine tool industry where during the past twenty years, more than half having been far below normal, machine tool salesmen have had to depend upon their own vision, ingenuity and initiative in order to create business for their manufacturers and for themselves.

"In the future our selling technique must be even more efficient, must be more creative. Every last vestige of the 'Diamond Jim Brady' type of selling must be removed.

"And as an industry, our better selling procedure must include better publicity for the business as a whole. More and more the public and the Government must be brought to realize that only through the creation of new products and more economical production of these articles by advanced machinery can the comforts of life and the material standards of living advance.

"In the meantime, we must now conduct our work and all of our present activities so that when we start making the sales of the machines to be delivered in 1950, we will be strong financially, strong in experience, strong in technical skill, strong in loyalty to our manufacturers and to our industry.

"If we follow this course, we shall have satisfaction as well as success *plus machines* to deliver in 1950."

September Construction At 11-Year High

• • • **September total of** construction contracts awarded east of the Rocky Mountains was the highest for that month since 1929, according to the F. W. Dodge Corp. Dollar volume was $347,651,000, a seven per cent increase over September, 1939.

Factory Health Program Launched in Illinois

• • • **National Educational** campaign to stimulate factory health programs will be launched on Oct. 24 by the Peoria Clinic on Health in Industry. More than 200 industrial relations men, doctors and manufacturers will attend the conferences which are sponsored by the Peoria Manufacturers and Merchants Association and the National Association of Manufacturers.

One Flying Fortresss Is Built Every 48 hr.

• • • **Boeing Airplane Co.** has announced a new expansion program for national defense work which will increase the floor area of its plants in Seattle, Wash., and Wichita, Kan., to a total of 74 acres—nearly five times their area a year ago. The Boeing plants, already enlarged to 2½ times their last year's area, will be nearly doubled again in size by the immediate construction of new additions totaling 1,600,000 sq ft. Present floor area is 1,635,000 sq. ft. The area a year ago was 682,500 sq. ft.

The expansion will make possible the employment of several thousand additional aircraft workers, and will radically increase the production rate of 4-engine Boeing Flying Fortresses and Stearman primary training planes for the national defense program. At the present time a production rate of one Flying Fortress every two days, and one trainer every three hours, has been reached.

Safety Program Held Vital to Defense Drive

Chicago

• • • **Because the defense** program has helped speed up the nation's industrial pace, that same program can be slowed down by increased factory accidents unless proper safety equipment and adequate safety programs are utilized. This opinion was advanced by C. Thiede, chief tool engineer, Chrysler-Jefferson plant of Chrysler Corp., at the National Safety Congress and Exposition in Chicago.

Defense Housing Contracts Are Awarded by Navy

Washington

• • • **Contracts totaling** $7,347,000 for defense housing have been awarded by the Navy Department as follows: McNeil Construction Co., Los Angeles, $1,263,000 for units at Long Beach, Cal.; Byrne Organization, Dallas, Texas, $2,284,000 for units at the naval operating base, Norfolk, Va.; and William Simpson Construction Co., Los Angeles, $3,800,000 for units at Diego, Cal.

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CIO Labor Pledge Sought by F.D.R.

Washington

• • • **John L. Lewis' call** at the White House via the back door on Oct. 17—just 19 days before the Presidential election — prompted political speculation last week but President Roosevelt said merely that two pending strike situations were discussed.

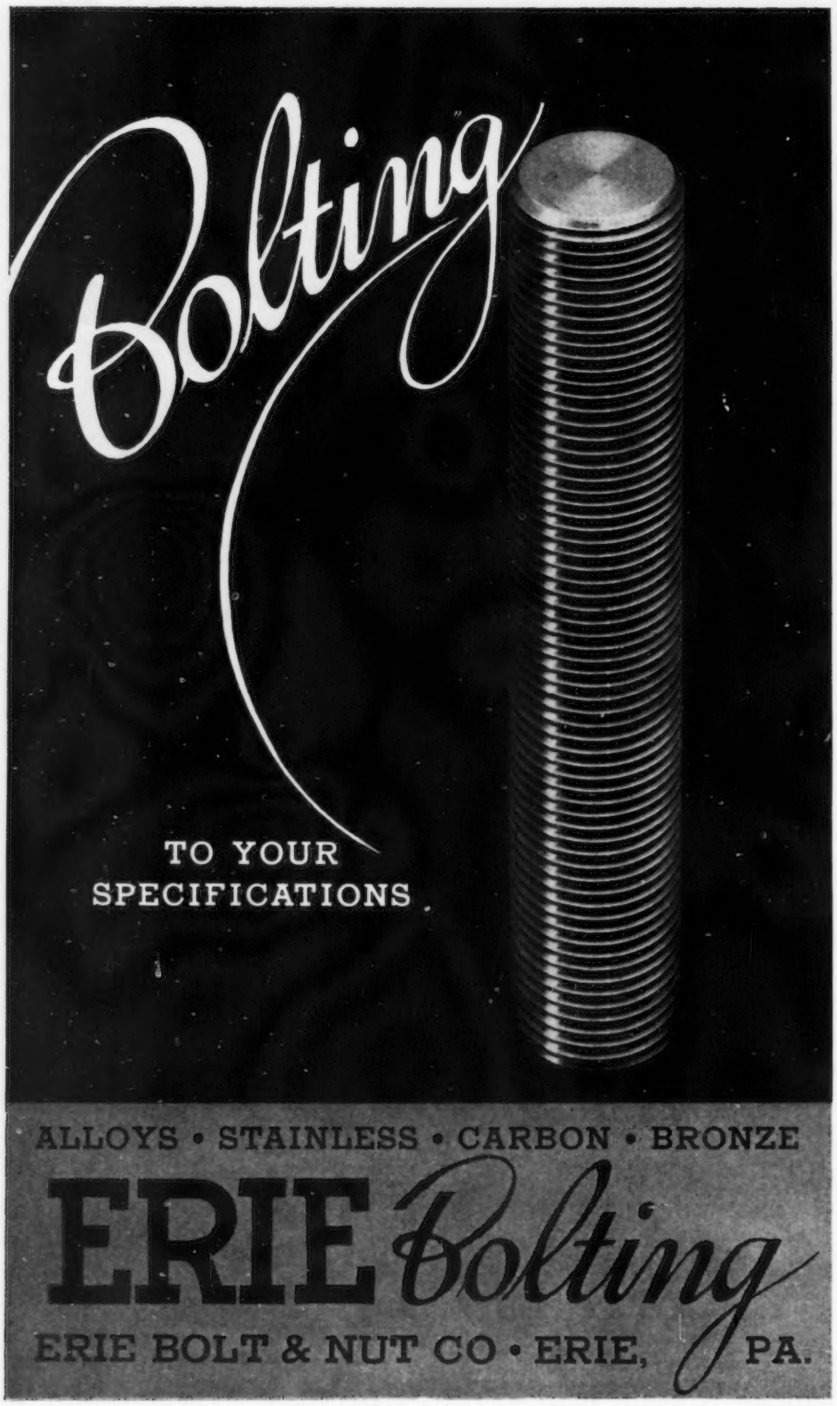
Nevertheless it is an open secret that what the Administration wants most from the CIO head is a pledge of CIO support in the forthcoming election. What the CIO wants most from the Administration is a boost for its organizing drive by way of a club denying government contracts to companies having difficulties with the National Labor Relations Board.

Newsmen who listened to Mr. Roosevelt's explanation of the Lewis visit were prompt to follow through with a question seeking the President's reaction to the government contract controversy. Without answering directly, Mr. Roosevelt referred to what he called a pending case involving Bethlehem Steel Co. He said it was his information that a conference for both sides of the controversy is being arranged.

(CONTINUED OF PAGE 79C)

Photo by International

ABOUT THE LABOR BOARD: Sidney Hillman, member of the National Advisory Defense Commission, is shown as he testified recently before the House Committee Investigating the Labor Board. Mr. Hillman is a vice-president of the CIO.



Canadian Orders Top Half Billion

Toronto

• • • **War orders placed** by the Department of Munitions and Supply and its predecessors since the outbreak of war now have passed the half-billion dollar mark, according to C. D. Howe, supply minister. Mr. Howe stated that to September 30, orders placed on Canadian account totaled $390,371,363 and for British account $134,260,529, making a total to the end of September of $524,631,892, while orders placed since the first of October bring the total close to $550,000,000.

Of the above total approximately 86 per cent of the orders were placed with Canadian firms, 9 per cent in the United Kingdom and about 5 per cent in the United States. Up to April 8 last, 11,170 contracts were awarded. From April 9 to the end of September 33,600 contracts were placed and this number was increased to over 47,000 on Oct. 12.

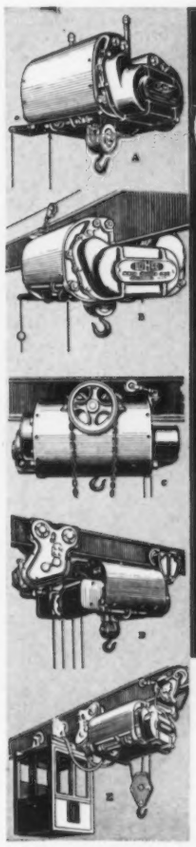
Some idea of the rapid expansion of Canada's war activities may be gained from the fact that the government's expenditure rose from $24,000,000 in May to $59,000,000 in August and nearly $67,000,000 in September. The average of $40,000,000 for the first six months of the year will jump to $116,000,000 monthly in the last half. The original estimate of expenditure for the fiscal year ending March 31, 1941, was set at $491,000,000 for the Army; $218,000,000 for the Air force and training, and $123,000,000 for the Navy. However, now it is understood that this total of $832,000,000 will be considerably exceeded.

Not all of the money being spent on war equipment plants will cease when the war is over. Much of the work is of a permanent nature, with airplane factories and chemical plants falling in the permanent category.

A total of 645 airplanes of various types have been made available for Canadian use in the past three months, Hon. C. D. Howe announced. These figures exclude production by Canadian Associated Aircraft, Ltd. The list includes planes built, 272; planes assembled, 176; planes assembled by R.C.A.F., 138 and planes delivered from the United States, 59. About 11,000 persons now are employed in production of aircraft, engine assembly plants, overhaul depots and the Anson program, an increase of roughly 40 per cent during the last three months.

Mr. Howe stated that a $3,000,000 plant extension program is underway to provide for the growing production of aircraft used in the Joint Air Training Plan, and plans are being prepared for two new plants at a cost of $2,500,000 for the construction and overhaul of airplanes.

For the two weeks ended Oct. 11, orders placed through the Department of Munitions and Supply, Ottawa, were valued at $24,371,294, of which orders valued at $100,227 went to United States firms. The



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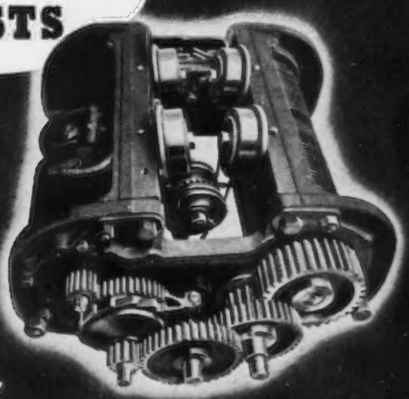

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list reveals big purchases of machinery and machine tools, orders for the two weeks totaling approximately $2,000,000. The more important awards follow:

Mechanical transport — The Metallic Roofing Co. of Canada, Ltd., Ottawa, $429,273; Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, $123,350; Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, $62,141; Four Wheel Drive Auto Co., Ltd., Kitchener, $384,540; C. O. Monat & Co., Ltd., Montreal, $174,255.

Aircraft — Canadian Car & Foundry Co., Ltd., Montreal, $632,205; Aviation Electric, Ltd., Montreal, $60,506; Switlik Canadian Parachute, Ltd., Montreal, $1,057,806; Irvin Air Chute, Ltd., Ottawa, $1,117,608; B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, $59,072.

Machinery—Williams & Wilson, Ltd., Montreal, $74,664; The Canadian Fairbanks Morse Co., Ltd., Ottawa, $133,321; Sheridan Equipment Co., Leaside, Ont., $87,230; The Modern Tool Works, Toronto, $148,653; J. H. Ryder Machinery Co., Toronto, $118,987; A. R. Williams Machinery Co., Ltd., Toronto, $49,021; Williams & Wilson, Ltd., Toronto, $56,286; The John Bertram & Sons Co., Ltd., Dundas, Ont., $556,332; Delamere & Williams, Ltd., West Toronto, $48,600; Ford Motor Co. of Canada, Ltd., Windsor, $250,000; J. E. Livingstone Machinery Co., Ltd., Windsor, $140,135.

Ordnance—War Office, England, $50,000; Turnbull Elevator Co., Ltd., Toronto, $44,675.

Rollway Bearing Co. Expands its Plant

Syracuse, N. Y.

• • • **Ground has been** broken on a site adjoining its present location by Rollway Bearing Co., Inc., to provide more plant capacity. The new building will be devoted to bearing assembly and shipping facilities.

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DIVISION OF ASSOCIATED SPRING CORPORATION
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COOK PLANT - ANN ARBOR - MICHIGAN

Steel Industry Has 3100 Full-time Salesmen

• • • **Backing up every one** of the steel industry's 3100 full time salesmen who serve the industry's thousands of customers, are two more members of the sales departments whose work does not include sales calls on customers. Those figures were compiled by the American Iron and Steel Institute from information supplied by companies which represent over 96 per cent of the industry's total capacity.

Altogether, there are about 5900 non-selling members of the industry's sales organizations. That total includes sales executives, branch office managers, clerks and office workers, and the large force of experienced engineers and metallurgists assigned to sales departments to work with steel users.

Reflecting the nation-wide distribution of the consumers of iron and steel, 36 of the 48 States contain at least one steel company sales office. No less than 165 cities in the United States contain either a branch sales office of some steel company, or the office of a sales agent for one of the companies in the industry.

A.S.M.E. Meeting

(CONCLUDED FROM PAGE 41)

The shell must perform its functions, but beyond that, Colonel Kresge believed the wider the tolerances are, the better. Standard specifications used today are as follows:

Shell Size	SAE Spec.	Yield Point Lb. per Sq. In.
75 mm. M48	X1340	55,000
3 in. M42	X1335	45,000
81 mm. M43	X1314	35,000
90 mm. M58	X1340	55,000
105 mm. M1	X1335	40,000
155 mm. M101	X1340	60,000
M102	X1340	50,000
	Bar Stock	
37 mm. M54	X1335	

In a paper discussing the heating of shell billets, Prof. W. Trinks, Carnegie Institute of Technology, described the various types of furnaces available, but indicated his preference for a rotary hearth furnace from the point of view of ease of charging cold work and pulling out billets which had been heated to the forging temperature of 2200 deg. F. In any type, even with controlled atmospheres, scale formation cannot be prevented, but it can be kept light and removed in a scale breaker.

War of Research Now On, Stout Says

Cleveland

• • • **The European war is a war of research, William B. Stout, president Stout Aircraft Corp. of Dearborn, Mich., told a Rotary Club luncheon here, Oct. 17.**

"The most important factor in the war," Mr. Stout said, "is airplane research. Germany has more men working on air research than England or any other country in the world. The next two generations of airplanes, and there is a new generation every two months or so, will go far to determining the victor.

"England needs the results of American airplane research far more than it needs American airplane production."

Becker Heads Sheet Metal Distributors

• • • **The National Association** of Sheet Metal Distributors, meeting last week at Atlantic City, elected A. J. Becker, of Evansville, Ind., president. George O. M. Johnston, of McClure-Johnston Co., Pittsburgh, was elected vice-president. New members of the executive committee are O. F. Murphy, Lyon, Conklin & Co., Baltimore, and James G. Beard, Bradon Mfg. Co., Terre Haute, Ind.

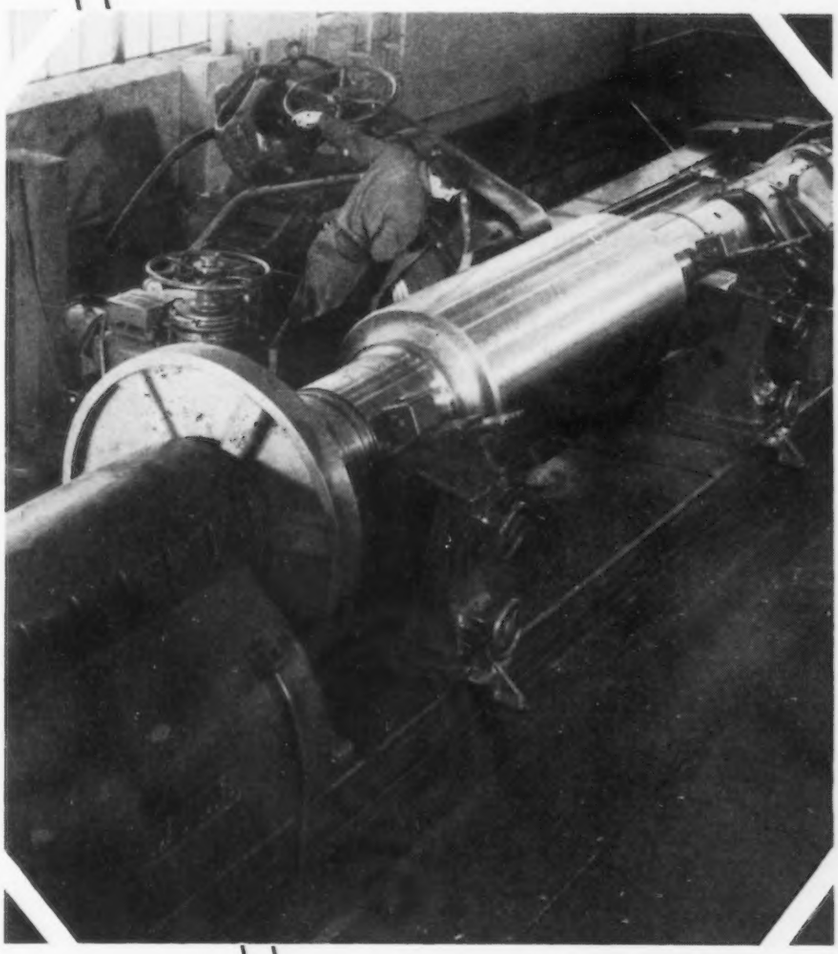
NLRB Calls Link-Belt Employees Election

Washington

• • • **The National Labor** Relations Board announced last Friday that a secret ballot collective bargaining election will be held within 30 days among production and maintenance employees at Link-Belt Co., Indianapolis, to determine whether they desire to be represented by Ewart Employees' Association, Inc., by SWOC, or by neither.

The board also has announced certification of SWOC as the collective bargaining agency selected by a majority of the production and maintenance employees of the Wheeling Steel Corp., at its warehouse and river terminal at Memphis, Tenn. The board said that an election held Sept. 20 resulted in a 58 to 0 count in favor of the CIO unit.

Picture



OF A ROLL MANUFACTURER CREATING PROFITS

Many means might be employed by a progressive roll manufacturer to create profits. Take the use of modern grinding equipment, for example . . . One manufacturer purchased the Landis 60" x 312" Type 30 Roll Grinder shown above. On it he rough and finish grinds roll bodies either straight or with a contour and grinds roll necks either straight or tapered. The weight of the work handled varies from 4400 pounds to 81,000 pounds. Because of the consistent outstanding performance it gives on such a wide variety of work, this machine literally grinds out profits. Here's a hint for all who manufacture or use rolls. Grind them the "Landis way" and create profits thereby. 349

LANDIS TOOL CO., Waynesboro, Pa.

Structural Steel Fabricators See Greater Defense Activity Ahead

• • • **The fabricated structural** steel industry will benefit to the extent of about a billion dollars' worth of construction work for national defense, according to T. H. Hendrix, director of statistics of the American Institute of Steel Construction, who analyzed the defense program at the annual meeting of the institute last week at White Sulphur Springs, W. Va.

"The Army is now planning for some 140 miscellaneous plants to cost when equipped $963,000,000," said Mr. Hendrix. "In addition, there will be large expenditures by the Navy for plants to provide for armor plate, forgings, ordnance and ammunition.

"Another defense activity from which our industry will benefit," he said, "is the building of new roads or improvement of existing highways of special military significance. While this work will be largely carried out as a part of the regular highway program, it will be speeded up and given preference over the normal road construction."

During the four months, June to September, inclusive, national defense orders have been placed for approximately 198,000 tons of fabricated structural steel, according to Mr. Hendrix's calculations. Of this tonnage, 55,186 tons was for hangars and 16,480 tons for machine and repair shops and other facilities at aviation fields, while 36,707 tons was required for industrial buildings for airplane manufacturers; a total of 108,373 tons for the air service alone.

Further analyzing the construction activity in structural steel, he said:

"The first eight months of 1940 witnessed a gain of 5 per cent in construction activity over the same period of 1939. This gain was built up in the months of July and August, due to the activities of the national defense program.

"At the end of the first six months of the year, public construction lagged some 23 per cent behind the previous year's record, while private construction, largely due to residential building and industrial plant expansion, showed a gain of 24 per cent.

"The months of July and August added almost three-quarters of a billion dollars to the construction total, of which 80 per cent was initiated by the work resulting from the defense program, bringing the public construction up to a level with the previous year's eight months' figure. Private construction did not quite maintain the gain it showed at the half year mark, but it did retain a 16 per cent advance over the eight months of 1939.

"Structural steel bookings closely followed this trend. At the end of June our bookings showed a total of 619,231 tons as compared with 666,247 for the first half of 1939. Of these bookings 27 per cent was accounted for by industrial plant building. Private construction had resulted in bookings amounting to 51.5 per cent while public construction had dropped to 48.5 per cent from a figure of 52 per cent for the year 1939.

"The month of July brought a flood of orders to the structural steel fabricators as the defense work opened up. The monthly total, 189,870 tons, was surpassed only twice since 1931, once each in the years of 1936 and 1937. August failed to sustain this large volume, due to inability of the procurement divisions of the Government to furnish completed plans and specifications for the many projects on the boards.

"Structural steel bookings for the first eight months of 1940 totaled 919,019 tons, a slight gain over the same period in 1939. With the tonnages in view the year, should, however, show a marked increase over 1939."

CLYDE G. CONLEY of Mount Vernon, Ohio, was reelected president of the American Institute of Steel Construction and all other officers were reelected. Three new directors were chosen to fill vacancies: F. H. Kimbrough, Muncie, Ind.; Walter Conger, Youngstown, and L. H. Krieger, New Orleans.

Based on a nation-wide survey that has just been completed, J. T. McGavin of the Yale University Bureau for Street Traffic Research, pointed to an estimated total of 2790 multiple parking garages as offering a potential $10,000,000 market for fabricated steel. Assuming $125 a ton, Mr. McGavin said that this market will require 80,000 tons of fabricated steel. The prospective market, it was added, was estimated upon only 10 per cent total building cost to fabricated steel. One garage design, called the James B. Steep double decker, Mr. McGavin stated, calls for 30 per cent structural steel. He explained that it is quite possible that through development of mechanical parking demountable all-steel parking could be made feasible. It was declared to be evident that the degree to which the newly opening market for fabricated steel is developed "depends in a large measure upon the energy and ingenuity used by steel fabricators to adjust their materials and standard shapes to the requirements of this special type demand." Mr. McGavin urged that while the steel industry is "very much absorbed in national defense preparations at the present time, it is well to look ahead now to cultivation of new markets to take up the

slack after the national emergency has passed.

Declaring that national defense is already dislocating the normal economy of the United States, Edwin B. George, Dun & Bradstreet economist, said that no country can throw $10,000,000,000 to $14,000,000,000 into miscellaneous, unproductive activities without something happening to its financial structure, its standard of living "and even its many self-indulgences which perhaps, just conceivably, it would never relinquish except in the purifying heat of a crisis."

In negotiated contracts, it was stated, an innocent-looking phrase, is packed a surprising amount of power for the pushing of economic consequences in one direction or another. Mr. George, nevertheless, said that through the use of the negotiation process responsible executives can move directly to their objectives without having "to dive blindly through red tape or being perpetually plucked at by obscure regulations about competitive bidding."

Negotiated contracts were pointed to as providing buying flexibility and it was stated that for the same reason priorities have been left on a voluntary and cooperative basis. Similarly, Mr. George said, the National Defense Advisory Commission has avoided resort to "blind authority in their efforts to keep prices generally within reach of the consumer's pocketbook." It was said that a rough division of duties has been contrived by the Price Stabilization Division and the Consumers Division under which the latter will preferably watch basic commodities, while the former concerns itself with items entering heavily into the standard of living. He said it would be no small achievement if a large part of the national defense job should be done at the present price level.

Paul Shorb, tax expert, of Washington discused the new excess profits tax-amortization at great length, outlining its many complications and technicalities, tax rates and other details as they will bear upon corporations. He said that it is believed that the amortization section, although very technical, "will operate reasonably and effectively provide the amortization allowance to taxpayers for the cost of emergency facilities which fall within the terms and provisions of Section 124, Code."

The Committee on Bonding legislation reported that the Federal Public Works Contractors Act, known as the Miller Act, is new being emasculated insofar as negotiated contracts under the rearmament program are concerned. The act is now before the Supreme Court of the United States for interpretation insofar as the provision for notice by material men to the contractor is concerned. Pointing out that it is still too early to form a final conclusion regarding negotiated contracts the committee said that should give the matter careful attention during the coming year.

The supplemental national defense act of 1940 authorizes the Navy and War Departments to waive both the bonds required by the Miller Act with respect to contracts for public works and utilities projects.

"It is still too soon to form a final conclusion as to these negotiated contracts, and therefore your committee should give this matter careful attention during the coming year," said the committee. "The heads of the departments involved should be urged to continue the bond requirement in the exercise of the discretion vested in them, unless a good reason for dispensing therewith appears, and wherever the head of a department or bureau, in the exercise of such discretion, waives the bonds, he should be required to file with the contract a statement of the reasons why the waiver of a performance or payment bond, or both, is recommended."

War requirements may retard but will not displace the elevated highway program, the Committee on Elevated Highways reported.

"Although there is no present intention of asking Congress for special money for the construction of defense roads, the final decision will depend on how much haste is desired," the report said. "The Public Roads Administration has been holding conferences with state highway officials in an effort to persuade the state highway departments to give precedence to defense roads. Should that not prove adequate, Congress might yet be appealed to for additional appropriations."

ARC WELDING TAKES A HAND in the construction of the new building of Harron, Rickard & McCone, Los Angeles machine tool dealers. The building is of rigid-beam, steel-frame type with monitor and 5-ton crane runway. The fabrication and field welding were done by the Associated Piping & Engineering Co., Ltd., of Los Angeles using General Electric motor-driven sets for the shop welding and gasoline-engine driven sets for the field work. Approximately 2500 lb. of G-E Type W-22-E electrodes were required for the job.

Government Contracts

• • • **Among the contracts** reported awarded by various government agencies during the week ended Oct. 12 are:

Iron and Steel Products:

B. B. Buell & Co., Seattle, Wash., ranges, $16,115.

Chapman Valve Mfg. Co., Indian Orchard, Mass., valves, $120,272.

The Baltimore Enamel & Novelty Co., Baltimore, steel sheets, $12,662.

The Central Foundry Co., New York, water pipe, $14,500.

Fort Pitt Bridge Works, Pittsburgh, fab. struct. steel, $150,000.

Southwest Welding & Mfg. Co., Alhambra, Cal., shutter dome units, $24,552.

Jones & Laughlin Steel Corp., Pittsburgh, steel bar, $120,790.

Crane Co., Long Island City, New York, valves, $13,949.

Albert & Davidson Pipe Corp., Brooklyn, N. Y., steel pipe, $13,100.

The Yale & Towne Mfg. Co., Stamford, Conn., padlock, $14,637.

The M. D. Larkin Co., Dayton, Ohio, mech. finger, indefinite.

Doehler Die Casting Co., Pottstown, Pa., upper caps, $28,900.

J. R. Hunt & Co., Baltimore, Md., motor mainten. equip., $31,011.

Jackes-Evans Mfg. Co., St. Louis, Mo., stove pipe, $22,334.

Louisville Tin & Stove Co., Louisville, Ky., spark arrestors, $19,639.

Crane Co., Norfolk, Va., valves, $30,849.

E. H. Edwards Co., San Francisco, wire rope, $15,293.

Anchor Post Fence Co., New York, chain link fence, $10,373.

Yarnall-Waring Co., Philadelphia, traps, $15,378.

Crucible Steel Co. of America, New York, steel bar, $13,276.

Western Can Co. (M. J. B. Co., owners) San Francisco, tin cans, $19,000.

Pacific Iron & Steel Co., Los Angeles, structural frame, $11,918.

Lukens Steel Co., Coatesville, Pa., steel plates, $82,945.

Union Iron Works, Erie, Pa., boilers, $78,831.

Graver Tank & Mfg. Co., Inc., E. Chicago, Ind., gas holder, $14,878.

H. Brinton Co., Philadelphia, aiming posts, $23,078.

Crosby Co., Buffalo, reel, $156,485.

The Steel Improvement & Forge Co., Cleveland, steel forgings, $23,660.

Allis-Chalmers Mfg. Co., Milwaukee, forgings, $178,350.

Heppenstall Co., Pittsburgh, forgings, $832,996.

Non-Ferrous Metals and Alloys:

Federated Metals Div. American Smelting & Refining Co., New York, metal type, $14,960.

The American Brass Co., Waterbury, Conn., copper tubing, $80,911.

Aluminum Co. of America, Washington, aluminum, $61,500.

International Silver Co., New York, forks and spoons, $92,700.

The American Brass Co., Waterbury, Conn., copper-nickel sheets, $16,816.

The American Brass Co., Torrington, Conn.

Taylor-Wharton Iron & Steel Co., Easton, Pa., alloy flasks, $29,362.

Revere Copper & Brass, Inc., Baltimore, Md., copper tubing, $96,359.

The International Nickel Co., Inc., New York, nickel, copper alloy, $37,722.

The American Brass Co., Waterbury, Conn., cartridge cups, $418,575.

Revere Copper & Brass, Inc., Baltimore, Md., cartridge cups, $268,100.

Machinery:

Ingersoll-Rand Co., New York, pneumatic drills, $10,080.

The Timken Roller Bearing Co., Canton, Ohio, roller paths, $24,554.

The Insinger Machine Co., Philadelphia, dishwashing machs. $10,735.

Cincinnati Shaper Co., Cincinnati, shearing mchs., $16,248.

Worthington Pump & Mch. Corp., Cincinnati, deaerating equip., $28,590.

Earle Hart Woodworking Machine Co., Chicago, matcher, $12,019.

Cincinnati Milling Machines & Cincinnati Grinders, Inc., Cincinnati, milling mch., $27,211.

Onsrud Machine Works, Inc., Chicago, lathes, $30,753.

The Henry & Wright Mfg. Co., Hartford, Conn., dyeing mch., $11,076.

Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn., boring mchs., $17,506.

Gloekler Mfg. Co., Erie, Pa., refrigerators, $64,250.

The Bullard Co., Bridgeport, Conn., turning mchs., $56,524.

The C. H. Gosiger Machinery Co., Dayton, Ohio, lathes, $17,041.

Monarch Machine Tool Co., Sidney, Ohio, lathes, $71,288.

The Cleveland Automatic Machine Co., Cleveland, lathe, $12,440.

Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, milling mchs., $10,090.

International Postal Supply Co., Brooklyn, N. Y., canceling mchs., $16,000.

Barrett Machine Tool Co., Meadville, Pa., facing mch., $12,950.

The Insinger Machine Co., Philadelphia, dishwashing mchs., $22,020.

Henry Prentiss & Co., Inc., New York, boring mch., $33,298.

Monarch Machine Tool Co., Sidney, Ohio, lathes, $31,096.

The Monarch Machine Tool Co., Sidney, Ohio, lathes, $23,598.

Lloyd & Arms, Inc., Philadelphia, lathes, $28,990.

Monarch Machine Tool Co., Sidney, Ohio, lathes, $119,463.

Consolidated Machine Tool Corp., Rochester, N. Y., lathes, $42,235.

Rockford Machine Tool Co., Rockford, Ill., slotters, $53,285.

Van Norman Machine Tool Co., Springfield, Mass., milling mchs., $20,612.

Rockford Machine Tool Co., Rockford, Ill., slotter mchs., $15,800.

W. E. Shipley Machinery Co., Philadelphia, lathes, $118,415.

The Heald Machine Co., Worcester, Mass., grinder, $15,713.

Cedar Rapids Engineering Co. of Del., Cedar Rapids, Iowa, grinder, $23,525.

Curtis Mfg. Co., St. Louis, Mo., compressors, $55,894.

Goss Printing Press Co., Chicago, plant equip., $505,490.

U. S. STEEL CORP. directors and officials on a recent plant inspection. Left to right: W. A. Irvin, former president and vice-chairman, U. S. Steel ; Robert C. Stanley, president, International Nickel Co.; Thomas W. Lamont, partner, J. P. Morgan & Co.; Irving S. Olds, chairman of the board, Benjamin F. Fairless, president; Enders M. Voorhees, chairman, finance committee; Nathan L. Miller, general counsel, all of U. S. Steel; Junius S. Morgan, partner, J. P. Morgan & Co.

Olds Calls Blows at U. S. System "Baseless"

Cleveland

• • • **Every requirement** of the government's defense program is being met without delay by United States Steel Corp. and some bomb casings are now being delivered, said Irving S. Olds, chairman of the corporation's board of directors, at a dinner in Hotel Statler, here, Oct. 17, climaxing an inspection tour of properties in the Cleveland-Lorain district.

Mr. Olds told the 400 civic and business leaders attending the banquet upon invitations from Benjamin F. Fairless, president of the corporation, that the total amount of steel which is now being furnished directly for national defense constitutes only a small fraction of the nation's total steel output.

The speaker paid tribute to Cleveland's early business leaders and then pointed out that theories attacking the effectiveness of private enterprise today are baseless.

Mr. Olds asserted that "the steel industry and business in general can be counted upon to perform allotted tasks promptly and efficiently.

"Within the Steel corporation we are building destroyers and cruisers," he said. "We are producing armor plate and developing additional facilities to provide armor plate for the enlarged Naval program; we are getting ready to produce shell forgings in quantity, as well as unloaded shells and bombs of various sizes—in fact, some bomb casings are now being delivered; we are selling large quantities of steel to Great Britain and Canada; we are undertaking to supply steel in one form or another to concerns located in different parts of the country who have taken Army or Navy contracts; our steamers are carrying strategic raw materials from foreign ports to meet defense necessities; in short, United States Steel is doing its best to cooperate with the officials in Washington and is meeting without delay every requirement of the Government. While the present high rate of operations in the steel industry (last week the Steel Corporation operated at 96.7 per cent of its total ingot capacity) is probably traceable in good measure to a demand growing out of the European war and our own preparedness effort, still the amount of steel which is now being furnished directly for national defense constitutes only a small fraction of the present production."

American Steel & Wire Builds Office, Laboratory

Cleveland

• • • **A new two-story** building to accommodate factory offices and the Cleveland district works chemical and physical laboratories of the metallurgical department will be constructed at American Steel & Wire Co.'s Cuyahoga Works, Cleveland.

No Further Scrap Conference Planned

Washington

• • • **Government officials** working on price stabilization said this week that no further conferences with industry are planned on the subject of scrap iron and steel. They asserted that leading scrap suppliers agreed after a meeting last week that "there is no indication of a further sharp rise in prices."

Following the Oct. 15 session, Defense Commissioners Leon Henderson of the price stabilization division and Edward R. Stettinius, Jr., of the raw materials division, released this statement:

"At the suggestion of the scrap makers the defense advisory commission is augmenting its studies of the supply situation with a view to the possibility of increasing supplies of heavy melting scrap by the wider use of large hydraulic presses for compressing lighter gage materials, such as automobile bodies, into heavy melting scrap form. Such presses represent substantial capital investment but permit preparation of scrap in a form more acceptable to the steel makers.

"Those present concurred in the opinion expressed at the session held a week earlier that the indications are that necessary supplies will be available at prices not out of line with those which have prevailed in recent years,

during which large quantities of scrap were in demand.

"In furthering this opinion, the scrap suppliers all agreed that the situation was not similar to that which prevailed in the middle of 1936 when steel makers, short of inventories, were bidding frantically for scrap. They also agreed that the market is orderly at this time and that there is no indication of a further sharp rise in prices."

Government spokesmen denied that they had specifically requested representatives of the railroads, automobile, farm implements and electrical machinery manufacturers to refrain from withholding supplies of scrap from the market. They expressed doubt that such a request was necessary in view of the desire expressed by scrap suppliers to "prevent a rising price spiral for iron and steel."

Attending the meeting held were:

H. G. Beatle, supervisor of salvage materials, General Electric Co., New York; Milton Meissner, assistant to general manager, purchases and traffic, Westinghouse Electric & Mfg. Co., Pittsburgh; C. O. Miller, General Motors Corp., Detroit; E. P. Reustrum, purchasing agent, International Harvester Co., Chicago; D. S. McDannel, director of purchases, Deere & Co., Moline, Ill.; Col. C. D. Young, vice-president, and D. J. Lamneck, purchasing agent, Pennsylvania Railroad, Philadelphia; W. C. Bower, vice-president, New York Central Railroad, New York; G. O. Beale, chief purchasing and stores officer, and J. L. Quarles, Chesapeake & Ohio Railroad, Cleveland; J. H. Lauderdale, general purchasing agent, Missouri Pacific Railroad, St. Louis; E. S. Jamieson, assistant purchasing agent, Union Pacific Railroad, Omaha, Neb.; B. B. Melgaard, assistant purchasing agent, Chicago, Milwaukee, St. Paul Railroad, Chicago; L. H. Skinner, Southern Railway, Washington, D. C.; and H. P. McQuilkin, assistant purchasing agent, Baltimore & Ohio Railroad, Baltimore.

Manganese Production At Leadville is Studied

Washington

• • • **Manganese production** at Leadville, Col., is discussed as a possibility in a report, just published by the Bureau of Mines. Under the strategic minerals investigations now being conducted consideration is being given to the Leadville possibilities under circumstances of national emergency. Because many of the mines are shut down a study of maps and production records, considered in connection with geological reports, promises a more satisfactory if not the only possible approach to the problem, the bureau says.

Labor Shortage Unlikely in Steel

• • • **No serious shortage** of labor exists at present in the steel industry, nor is there any threat of such shortage in the future, it is revealed by a survey just completed by the American Iron and Steel Institute. Substantially all of the steel companies covered by the survey reported that the labor supply now readily available to them is ample to assure operations at full capacity. Several companies reported that they are already running at capacity, with no labor shortage in sight.

These reports were based on present conditions, with no attempt to predict the effect of a large military training program, or of a sharp rise in employment in other industries.

Four measures applied by the steel industry over a period of years are largely responsible for building up and maintaining adequate reservoirs of labor. They are:

1. Apprentice programs. In considerably more than half the companies in the industry, a total of nearly 4000 apprentices are now receiving an extensive program of practical education in key departments.
2. Job-training for specific

JAPAN GOT HALF SCRAP STEEL EXPORTED FROM U. S. SINCE 1933

• • • More than 21,500,000 net tons of iron and steel scrap have been exported from the United States since January, 1933, over half of which went to Japan, according to the American Iron and Steel Institute.

The total tonnage of scrap exported since 1933 is more than five times as much as total scrap exports in the first 32 years of this century. Prior to 1900, exports of scrap were negligible.

Both the tonnage of scrap exports and their destinations are likely to be affected by the embargo recently placed on scrap exports from this country to all parts of the world except to Great Britain and to countries in the Western Hemisphere.

Japan, until the middle of this year by far the largest purchaser of American scrap, is the market chiefly affected by the terms of the embargo.

In the first five months of 1940, before the war in Europe intensified, approximately 31 per cent of the 1,291,000 tons of scrap shipped went to Japan, while 26 per cent went to Great Britain. Other European nations, particularly France and Italy, together took 31 per cent during the same period. Canada took 9 per cent.

During June, July and August of this year a total of 1,109,000 tons of scrap was exported, or 43 per cent more per month than during the first five months of the year.

Japan continued to take 31 per cent of the total during those three months, but ranked second to Great Britain which took 44 per cent. Canada's share of scrap exports rose sharply to 17 per cent of the total.

Exports of scrap to continental Europe dropped off practically to nothing after mid-June, according to the institute.

duties, under which promising young men are given intensive training for relatively brief periods in special operations or particular jobs. About two-thirds of the companies now are engaged in such job training.

3. Work-sharing during depression periods, which retained thousands of skilled and semiskilled men on the payroll, instead of turning them loose to drift into other jobs and industries.
4. High wage scale. Wage earners in steel plants receive an average of 85 cents per hour, or about one-third more than the average hourly wage in all manufacturing industries.

The survey showed that through these methods the steel companies have up to this time been able to meet substantially their entire requirements for additional labor from local sources, without bringing in men from distant regions, which would create housing and other problems.

Ajax Mfg. Co. Will Expand Cleveland Plant

Cleveland

• • • **Ajax Mfg. Co.,** maker of forging machines and other metal working machinery, has awarded a contract to H. K. Ferguson Co. for the design and construction of a one-story extension to its plant in suburban Euclid. The building will be of structural steel frame, brick spandrels, steel sash, wood roof, and oak floor on concrete sub-base. A crane runway 200 ft. long will be installed.

Umpire Chosen For GM-UAW Labor Dispute

Detroit

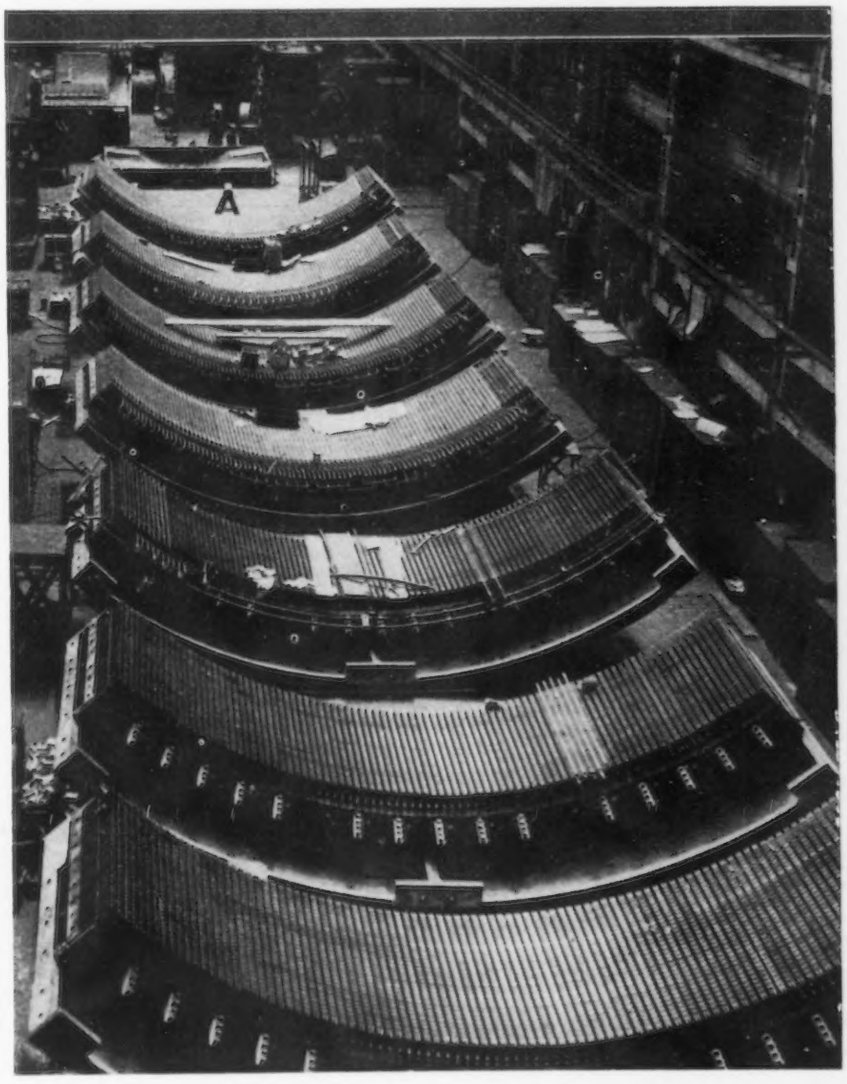
• • • **Under terms of an agreement** that exists between General Motors Corp. and the UAW-CIO, Dr. H. A. Millis, professor emeritus of economics of the University of Chicago, has been selected permanent umpire of labor disputes. This marks the introduction of the permanent umpire set-up in the automobile industry.

Sales for 9 Aircraft Companies $255,004,218

Washington

• • • **Total net sales** during 1939 by nine of the most important American aircraft corporations amounted to $255,004,218, as compared to $171,016,224 in 1938, according to the Federal Trade Commission. Costs and expenses applying to goods sold last year, or the total operating outgo amounted to $208,787,934, as compared to $145,434,398 in the earlier year. These costs and expenses included raw materials, wages, taxes, depreciation, etc.

The figures are disclosed in a report on "Aircraft Manufacturing Corporations." The combined net income of the nine "aircraft" corporations before payment of income taxes for 1939 amounted to $45,405,826 on an average investment of $131,827,219, and this income represented an average rate of return of 34.4 per cent for this group. The individual rates of return ranged from a loss of 60.5 per cent for one corporation, to a gain in rate of return of 98.8 per cent for another corporation. The rate of return on the average capital employed of $112,375,309 during 1938 was 24.2 per cent.



SLICES OF POWER—Seven stator stations in a row are pictured being built for a water wheel generator at Westinghouse Electric & Mfg. Co.'s East Pittsburgh works.

Armco Announces Plant Expansion

American Rolling Mill Co. this week announced a $5,000,000 plant improvement program to include a $3,800,000 4-stand, 4-high, 54-in. cold reduction mill, building and auxiliary equipment at its Middletown, Ohio, plant.

The company will also construct 25 additional by-product coke ovens and improvements at the Hamilton, Ohio, plant at a cost of $1,500,000, and a new soaking pit at Middletown. Several weeks ago the company started enlarging one of its Hamilton blast furnaces.

Construction of the new cold reduction mill will be started immediately, most of the contracts having been awarded, Charles R. Hook, Armco president, said. Operation is scheduled to start in from eight to 10 months. Included in the estimated costs are additional furnace capacity for heat-treating and tempering steel, a large storage building, a pickler building and a roll shop. Plans have also been made for enlarging the open hearth production at the Middletown plant although no new furnaces will be installed. The mold yard there is being enlarged and new trackage will be laid.

"Steel is the backbone of national defense," Mr. Hook said. "During the next three years there is every indication that a sustained demand for large tonnages will exist, both for our vast national preparedness program and to maintain our normal standard of living. Attempting to anticipate the stress which we expect to fall upon the steel industry, we are doing everything within our ability to modernize our plants, make our processes more efficient and increase production to meet the direct and indirect needs for defense."

U. S. to Buy 18,000 Tons Of Tin Ore from Bolivia

• • • **After extended** negotiations, the Metals Reserve Co., the government's strategic material buying agency, has entered into a five-year agreement with Bolivian tin producers to purchase sufficient concentrates to reproduce about 18,000 tons of fine tin.

Ford Assemblies Highest Since 1929

Detroit

• • • Ford Motor Co. has upped its automobile assembly schedule from 4200 units a day to 5300 units a day, it has been learned. This is the biggest production schedule since 1929.

The resulting demand for steel is keeping Ford open hearth furnaces and rolling mills operating at 100 per cent of capacity and has resulted in extra pressure to obtain increased delivery of steel from suppliers. The normal of about 24 days' supply has been sharply reduced by the 25 per cent increase in demand, and an attempt is being made to increase the inventory accordingly.

Steel Companies Net Advances in 3rd Quarter

• • • **Sharon Steel Corp.** reports earnings of $365,975 for the quarter ended Sept. 30, after depreciation, taxes and other charges, comparing with a net loss of $59,483 in the like period of 1939.

Keystone Steel & Wire Co. reports for the third quarter net profit of $280,409 after all charges and taxes, compared with a net profit of $273,922 for the corresponding quarter last year.

• • • **Jones & Laughlin Steel Corp.** reports for the quarter ended Sept. 30, subject to annual audit and adjustment, a consolidated profit for the corporation and its subsidiaries of $2,956,647 after all charges, including depreciation, depletion, interest and taxes. This compares with a profit of $1,129,-001 reported for the quarter ended Sept. 30, 1939. Consolidated profit for the nine months ended Sept. 30, 1940, shows $6,232,903 compared with a profit of $281,189 for the same 1939 period.

Goodyear to Expand Plant at Gadsden

Birmingham

• • • **Paul W. Litchfield,** chairman, Goodyear Tire & Rubber Co., announced here that Goodyear planned an expansion of its Gadsden, Ala., plant shortly after Jan. 1.

Wage Increase Ends New York Ship Strike

• • • **A 7 per cent wage** increase by New York Shipbuilding Corp. last week ended a strike of 950 employees at Camden, N. J., following an agreement between the company and the Industrial Union of Marine and Shipbuilding Workers giving the union, a CIO affiliate, the right to represent all employees. A demand for the union shop and dues check-off was dropped. Any workman who takes a job with the union is to be permitted a two-year leave of absence without loss of seniority.

Monarch Earnings $800,977 in 9 Months

• • • **Monarch Machine** Tool Co., Sidney, Ohio, reports net profit of $800,977 for the nine months ended Sept. 30, after provision for depreciation, normal Federal income taxes and a special reserve for estimated excess profit taxes and other contingencies covering the period. The net profit is equal to $3.81 per share on the 210,000 shares of common stock now outstanding and compares with a net profit of $377,830 or $1.80 per share for the same period of 1939 on a comparable share basis.

Westinghouse Steam Division Works to Expand

Philadelphia

• • • **Westinghouse Steam** Division works near here will expand present facilities at a cost of more than $9,500,000, to expedite delivery of turbines for 45 fighting ships of the U. S. Navy. According to R. A. McCarty, manager, recent contracts which total more than $64,500,000 have established a new record backlog of orders for the steam division works.

Rust Engineering Gets Shell Forging Contract

Pittsburgh

• • • **Rust Engineering Co.** here has been awarded a $1,500,000 contract for a shell forging plant to be located at Gadsden, Ala. Fabricated steel tonnage involved is as yet undetermined. It is understood that when the shell plant is completed it will be operated by the Landsdowne Iron & Steel Co., Morton, Pa.

The Iron Age

". . . The war we must prepare for is a war of machines and machines are produced by factories, and factories are industry. Let's face it; whatever the cause here, production is stalled here, as it was in France. The NO. 1 BOTTLENECK OF PRODUCTION is now sitting in the White House."

—Clare Boothe

Trade Notes . . .

Lithium Corp. has moved to the Raymond-Commerce Building, Newark, N. J., from 175 Fifth Avenue, New York, Harold J. Ness, president, announces.

•

Craven-Whittaker Co., Inc., has moved its factory and office to 215 Georgia Avenue, Providence, R. I.

•

Carboloy Co., Inc., is opening a branch office in Los Angeles, according to K. R. Beardslee, Carboloy sales manager. The new office is located at 5905 Pacific Blvd., Huntington Park, Los Angeles.

•

Rights for manufacture and distribution of Oman self-lubricating metal have been acquired by the Kitson Co., Philadelphia, according to Morse DellPlain, president, Kitson Co.

•

H. A. Smith Machinery Co., Erie Boulevard East and South Townsend Street, Syracuse, N. Y., has been appointed a distributer for Sullivan Machinery Co.

•

Ministry of Public Works and Ministry of Communications, Government of Mexico, Mexico, D. F., acting jointly with Petroleos Mexicanos, Mexico, official Mexican oil company, plan welded steel pipe line from oil field in southern part of Vera Cruz to Salina Cruz, a port on Pacific Coast, crossing Isthmus of Tehuantepec, about 186 miles in all, for crude oil transmission to latter place, where a large bunker oil distribution plant will be established. Work is scheduled to begin soon. Cost close to $15,000,000 with booster stations and other operating facilities.

Long Beach, Cal., will take bids Oct. 4 on 2700 ft. of 8-in., 18,000 ft. of 10-in., 2300 ft. of 12-in., and 400 ft. of 18-in. electric welded steel pipe under Specification C-608.

•

Industrial Finishing Co., 61 Hamilton Street, New Haven, Conn., has changed its name and address to Connecticut Metal Finishing Co., Haig Street, Hamden, Conn.

•

Universal Gear Corp., Indianapolis, announces appointment of Lloyd B. Edwards and associates as district representatives for the Minneapolis territory. The Edwards office is at 841 Lumber Exchange Bldg., Minneapolis.

•

Jones & Laughlin Steel Corp. has changed the name of its lightweight channel section to "Junior Channels" in order to better associate the product with the company's "Junior Beam," a structural steel section which they originated some time ago. The junior channel was designed recently, especially for stair stringers and stair treads in schools, auditoriums, hotels, and other light occupancy buildings or light construction framing.

•

Walsh Refractories Corp. has moved its general offices to new and larger quarters at 4070 North First Street, St. Louis.

•

Gisholt Machine Co., Madison, Wis., has filed a registration statement with the SEC covering a proposed offering of 74,426 shares of common stock of which 23,127 shares will reimburse the company treasury in part for expenditures of commitments for additional machinery and the remainder is being obtained from present holders.

Welding Equipment & Supply Co., Detroit, announces the removal of its offices and plant to 223 Leib Street, Detroit.

•

Elyria Engineering & Tool Co., Inc., engineers and manufacturers of precision tools, has opened a plant in Elyria, Ohio. M. Han is president of the company, which expects to employ 12 persons at the start, increasing to 36.

•

Cleveland Welding Co., Cleveland, has awarded a contract to the H. L. Vokes Co., for the construction of a shop addition. H. W. Kranz is president of the welding company.

•

Cleveland Worm & Gear Co., Cleveland, of which Howard Dingle is president, will increase its manufacturing space by the addition of a wing to its plant at 3249 East 80 Street. H. K. Ferguson Co., Cleveland, will design and erect the new structure

•

Cuyahoga Foundry Co., Cleveland, has announced an addition to the company's foundry buildings. It is planned to erect a brick and steel one-story structure to contain approximately 10,000 sq. ft.

•

Dempsey Plastic Parts, Inc., has leased a two-story building at 1426 West 25 Street, Cleveland, and is preparing to start production.

•

Fulton Foundry Co., Cleveland, in addition to erecting a new core room at its plant at 7325 Morgan Avenue, will also expand the foundry, pattern storage quarters and charging space. Plans for the additions have been prepared by Walther J. Wefel. The brick and steel one and two-story structure will be 30 x 200 ft. A. C. Denison is president of the company.

•

Multi-Alloy Die Casting Machines, Inc., has been formed at Cleveland by James L. Love, who will be president, and George S. Davis, who will be secretary-treasurer, to manufacture die casting equipment. Officers of the company are also identified with the Cuyahoga Tool & Mold Co., and it is expected that preliminary operations will be carried on in the plant of that company at 16131 Holmes Avenue.

•

Infra Red, Inc., 1633 East 40 Street, Cleveland, a new company formed by William J. Miskella, is preparing to manufacture a newly developed unit for baking industrial finishes. The device uses special infra-red lights and reflectors and is said to produce results similar to japanning without the use of ovens. Manufacturing operations will be started about Nov. 15 after necessary equipment is installed.

•

Henry Disston & Sons, Inc., has just announced that the Triangle Steel Corp., 2415 Santa Fe Avenue, Los Angeles, has been appointed agent for the sale of Disston Tool Steels in southern California, Arizona and Nevada.

•

Otto Konigslow Mfg. Co., Cleveland, manufacturers for over 30 years of high-grade light and medium weight stampings, has been purchased by Chester A. Thompson, who will operate the business as an individual under the company name. Rodney C. Murphy, who has had many years' experience in Cleveland and elsewhere in the job stamping business, will continue with the company.

Charlestown Powder Plant Will Cost $51,000,000

Washington

• • • **The War Department** has awarded a contract to the E. I. duPont de Nemours & Co., for additional facilities at Charlestown, Ind., for manufacture of smokeless powder. The original project was announced on July 17, 1940 at an approximate cost of $25,000,000. The cost of the additional facilities is estimated at approximately $26,000,000 which brings the total cost of this plant to about $51,000,000.

CIO Labor Pledge Sought By F. D. R.

(CONCLUDED FROM PAGE 70)

The CIO proposal to withhold contracts from companies found by the NLRB to have violated the Wagner Act appeared to have reached the point of acceptance several weeks ago when Sidney Hillman, labor representative on the National Defense Advisory Commission, held a press conference and made public letters from the War and Navy Departments. Both departments agreed that the defense commission's statement of labor policy, which said that contracts should be awarded only to labor law adherents, would be incorporated as a part of defense contract forms. An informal opinion from Attorney General Robert H. Jackson said that in establishing a system for denying contracts to cinch the move the War and Navy Departments would have to recognize any orders issued by the labor board until reversed in the courts.

The special House committee investigating the labor board then called key government officials to explain the move. The gist of the testimony was that while the Army and Navy apparently had adequate authority to crack down on alleged violators of the Wagner Act they had no plan to withhold contracts on that basis alone.

Last week, however, in a move further confusing the issue, the Acting Comptroller General Elliott ruled that since Congress has been given power to negotiate contracts, the War and Navy Departments can deny contracts on any basis they choose, even though bids are advertised for under the old competitive bidding procedure.

Largest National Metal Show Opens

Cleveland

• • • **The twenty-second** National Metal Congress and Exposition, largest in history from the standpoint of floor space, got under way here Monday. The show opened at noon after morning sessions inaugurated the technical programs of the four participating societies, the American Society for Metals, American Welding Society, the Wire Association and the two divisions of the American Institute of Mining and Metallurgical Engineers.

Renewed interest in the Bessemer process of steel making, materially strengthening the steel industry's position in the national defense program through increasing steel production and by conserving the nation's scrap supply, was indicated by H. W. Graham, director of metallurgy and research of the Jones & Laughlin Steel Corp., Pittsburgh, who spoke before the iron and steel division of the A.I.M.E.—predicting that eventually the Besesmer process would be controlled with a precision that will be impossible in open-hearth steel making, Mr. Graham said: "It would be hard to find in any phase of the steel industry a more fruitful field for research than the Bessemer process of today, or any field wherein results obtained would contribute to larger or more important economic and commercial considerations.

Presentation of the Lincoln gold medal for 1939-1940 Miller Memorial Award featured the opening session of the American Welding Society's annual meeting in Hotel Cleveland. The Lincoln medal went to H. J. French and T. N. Armstrong, metallurgists of the development and research division of the International Nickel Co., Inc., for their technical paper on "Weld Hardening of Carbon and Alloy Steels," which was originally presented Oct. 23, 1939, at the Chicago convention.

The Miller Memorial Award was presented to William Spraragen, editor of *The Welding Journal* for 18 years. A technical session on welding in shipbuilding and in rigid frame structures followed the presentation of prizes Monday morning.

Photo by International

MOBILIZING AMERICA: Organizing America's economic strength was discussed by William S. Knudsen, left, Defense Commissioner, Alfred P. Sloan, Jr., center, chairman, General Motors Corp., C. F. Kettering, right, vice-president, General Motors, and other industrial leaders at Mr. Sloan's luncheon held Oct. 15 at the Waldorf-Astoria Hotel.

Under the direction of F. A. Westphal, Sheffield Steel Corp., Kansas City, the technical sessions of the Wire Association started Monday afternoon with papers by James R. Longwell, Carboloy Co., Inc., Detroit; Joseph A. Doyle, vice-president, W. S. Rockwell Co., New York; and J. P. Zur, Trauwood Engineering Co., Cleveland.

Preliminary to the opening of the American Society for Metals convention, the society held open house Sunday afternoon at its new national headquarters at 7301 Euclid Avenue here. Several hundred persons visited the new quarters. Technical sessions of the A.S.M. are being held this week in Hotel Statler and at Public Auditorium.

Reading Pipe Plant to Begin Production Soon

• • • **Recently organized** to take over the pipe making capacity of the former Reading Iron Co. at Reading, Pa., the Reading Iron & Steel Co. plans to produce pipe for domestic purposes within two months. The plant will have an annual capacity of 21,000 tons of galvanized and 9000 tons of black pipe in sizes from ½ in. to 4 in. and will have equipment for producing electrically welded thin wall steel conduit and redrawn furniture tubing. Officers are George H. Heck, president; Edwin M. Robinson, secretary, and Edward M. Rand, treasurer.

Auto Makers Pledge Help for Defense

• • • **Automobile** manufacturers, with more than a half billion dollars of defense contracts already awarded to their industry, last week pledged themselves at New York to subordinate future model changes to defense. The manufacturers likewise decided to appoint a committee to cooperate with the aviation industry, tool and die makers and body shops in determining and listing all available facilities.

At a luncheon held by Alfred P. Sloan, Jr., for 500 industrial leaders and business men, William S. Knudsen, member of the National Defense Advisory Committee, said that the country "must have all equipment for 1,200,000 men and all heavy equipment for 800,000 more by April 1, 1942. If you gentlemen figure you are going to need a lot of machine tools in order to carry out your American way of life you had better take another look."

Mr. Sloan told his luncheon guests that "the immediate job before us undoubtedly is the capitalization of the coordinated efforts of industry to the end that, in the shortest possible space of time, our military defense may place us in an impregnable position. Superimposed upon this problem," said Mr. Sloan, "is the responsibility of providing all possible material assistance to Great Britain—to my mind, our first line of defense."

Personals

Change is inevitable in progressive Industry. Change is constant.

• **James H. McNeal** has been appointed purchasing agent, Weirton Steel Co., Weirton, W. Va., to succeed the late E. H. Kern. Mr. McNeal has been with the Weirton Steel Co. since 1918 and has been assistant purchasing agent for a number of years.

• **Eugene R. Perry** has been made manager of engineering and superintendent of the Micarta works of the Westinghouse Electric & Mfg. Co., Trafford, Pa. Mr. Perry, who has been associated with Westinghouse since 1929, has been acting superintendent of the Micarta works since May of this year. Following seven years of specialized studies of resins in the Westinghouse Laboratories, he was transferred to the Micarta works in 1936, becoming engineering manager two years later.

• **John D. Gordon,** Taylor-Winfield Corp., Warren, Ohio, has been elected chairman of the American Welding Society, Youngstown Section. **W. Tam** of Carnegie-Illinois Steel Corp., is vice-chairman and **A. L. Williams,** Federal Machine & Welder Co., Warren, is secretary-treasurer.

• **Wilbur R. Varney,** for the past two years identified with the Bethlehem Steel Co., has been appointed metallurgist of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., succeeding **Roy A. Gezelius.** Mr. Varney was graduated from Northeastern University in 1937, where he was a cooperative student with the metallurgical department of the Hunt-Spiller Mfg. Corp.

• **Joseph Michaels,** president, Hyman-Michaels Co., celebrated his 50th year in the scrap iron business at a dinner given him Oct. 21 in Chicago by directors of the company. Born in Cincinnati in 1872, he went to Chicago in 1886 as billing clerk for the Block-Pollak Iron Co., Cincinnati and Chicago. With Joseph Hyman in 1911, Mr. Michaels formed the present company. Mr. Michaels has been active in civic and philanthropic activities, at various times serving on the War Industries Board, NRA Advisory Council, and president of Jewish Peoples Institute.

• **R. G. Ingersoll,** president, Ingersoll Steel & Disc division of Borg-Warner Corp., Chicago, has been elected president of Illinois Chamber of Commerce. Other new officers elected: **H. J. Neumiller,** Humitube Mfg. Co., Peoria, Ill., vice-president; **Lawrence Stern,** president of American National Bank & Trust Co., Chicago, treasurer; **W. F. Gerdes,** president of Michelmann Steel Construction Co., Quincy, Ill., chairman of the board.

• **D. C. Peterson,** formerly vice-president in charge of manufactures of the Buda Co., Harvey, Ill., has been appointed works manager of the Superior Engine division of the National Supply Co., Toledo. He joined the Buda Co. in 1915 after graduation from the Armour Institute of Technology and was successively plant engineer in charge of all mechanical and electrical operations, divisional superintendent of railway motor cars and engine divisions. For eight years he was general superintendent and assistant to the vice-president in charge of manufacture. In 1934 he joined Continental Can Co., New York, as chief engineer of the tin plate mills, and spent two years in Europe constructing and organizing tin plate mill operations for the Metal Box Co., Ltd., a British subsidiary. Upon returning to the United States, Mr. Peterson had charge of rehabilitation of various Continental Can plants throughout the country. He returned to the Buda Co. as vice-president in charge of manufacture in 1939.

D. C. PETERSON, works manager of the Superior Engine Division of the National Supply Co.

• **Maj. L. M. Nesselbush** and **David A. Endres,** have been elected to the board of directors of Falcon Bronze Co., Youngstown, to succeed members who died recently. Major Nesselbush, sales manager, who has been with the company for 25 years, was elected a vice-president and director to succeed the late R. H. Doeright. He was graduated from Lehigh University in 1920, specializing in metallurgy; is actively interested in the Army Reserve Corps and is assigned to the 426th Infantry regiment, a tank outfit. Mr. Endres, general superintendent of the Youngstown Hospital Association, and a graduate of the University of Michigan, was elected to fill the vacancy created by the death of C. H. Kennedy.

• **W. O. Taylor,** of the Allis-Chalmers Mfg. Co., Milwaukee, has been elected chairman of the Wisconsin Exporters' Club, for the coming year. Other officers chosen were **H. V. Schaack,** Waukesha Motor Co., secretary; **J. N. Johnson,** Fulton Co., Milwaukee, treasurer, and directors, **E. V. Gumpert,** Harley-Davidson Motor Co.; **E. A. Travis,** National Enameling & Stamping Co.; **R. T. Craig,** Bucyrus-Erie Co., and **H. G. Stout,** Chain Belt Co., all of Milwaukee.

• **W. T. Roundy,** who began his career in the manufacturing division of Cutler-Hammer, Inc., Milwaukee, and later served in the Cincinnati and Indianapolis offices of the company in a sales capacity, has been transferred to the Atlanta office. He has been assigned to Florida and will make his headquarters at Orlando.

• **David Fitzgerald,** for the past six years auditor of the plastics department of the General Electric Co., has been appointed assistant to **G. H. Shill,** manager of the department, which has its headquarters in Pittsfield, Mass.

• **Norman L. Deuble,** of the Copperweld Steel Co., Warren, Ohio, spoke on "Service Failures in Steel" in Minneapolis on Oct. 16 before the Northwestern chapter of the American Society for Metals.

• **John F. Tinsley,** president of the Crompton & Knowles Loom Works, Worcester, Mass., has been reelected president of the Associated Industries.

• **Edward M. Handley,** former foundry superintendent of the Chain Belt Co., Milwaukee, and now a trouble shooter at the plant, will celebrate 50 years of association with the foundry business in November. It was the rantings of a boss in a Chicago foundry over the hit and miss methods of analyzing pigs that caused Handley to quit his job and enter the university to study metallurgy. He quickly landed a job as assistant foreman at the Gisholt Machine works in Madison, Wis., later going to the Ottumwa Iron Works in Iowa and then to the Old Gas Engine Works at Lansing, Mich. He has been with Chain Belt 28 years.

• **Harvey Wilson,** formerly in charge of the Philadelphia sales office of the Babcock & Wilcox Tube Co., New York, has been transferred to New York as district sales manager. He will also have jurisdiction over the Philadelphia office, to which **R. M. Lackner** has been transferred from Detroit. **B. F. W. Seaburn,** heretofore of the Beaver Falls, Pa., sales office, has been placed in charge of the Detroit office.

• **Dr. Claude L. Clark,** heretofore of the department of engineering research of the University of Michigan, has joined the metallurgical staff of the Steel & Tube division of the Timken Roller Bearing Co., Canton, Ohio. During the past 10 years he has carried on studies on the properties of metals at elevated temperatures, for which Timken has been one of the principal sponsors.

• **N. E. MacCallum,** who as superintendent of the steel plant, has served the Phoenix Iron Co., Phoenixville, Pa., for nearly 40 years, has retired, effective Nov. 1.

OTTO V. GRAY, assistant to general superintendent, Gary sheet and tin mills, Carnegie-Illinois Steel Corp., whose retirement on Oct. 1 was announced in these columns recently.

• **C. Milton Ekberg,** of the sales engineering department of the Norton Co., Worcester, Mass., has been appointed field engineer in the Chicago district, and **William A. Russell** has been appointed to a similar post in the Pittsburgh territory. **Alden P. Johnson** has been transferred to South Bend, Ind., and **J. L. deVou** has been appointed a salesman in the Toledo district.

• **W. J. Jeffries,** senior materials engineer of the Bureau of Construction and Repair of the Navy Department, and more recently in the newly formed Bureau of Ships in the Division of Research and Specifications, has resigned to accept the position of chief inspector of the Philadelphia Ordnance District of the U. S. Army at Philadelphia. Mr. Jeffries has been for many years a member of the A.S.T.M., A.S.M., A.W.S., and A.S.M.E. and is widely known in engineering and technical societies.

• **Walter J. Burns** has been named plant manager of the Chevrolet transmission division at Saginaw, Mich., succeeding Harold M. Spears, who died recently. Mr. Burns has been general superintendent of the plant since 1936.

• **Dr. Harry P. Evans,** consulting metallurgist, formerly chief metallurgist for Ingersoll Steel & Disc Co. and Calumet Steel Co., divisions of Borg Warner, has been retained by Laucks Laboratories, Inc., Seattle, to be in charge of the metallurgical and physical testing departments.

• **W. C. Weslow** has been named manager of the mining division of Carboloy Co., Inc., Detroit. He joined the company in 1931. For the past nine years he has been field and development engineer in connection with diamond impregnated tools. Announcement of his appointment coincides with the release by Carboloy Co. for commercial usage of its Sinta-set Diamond impregnated core bits.

• **R. F. Herr,** consulting engineer for several steel companies in the Mahoning Valley, specializing in the development of new types of products and machinery, has been appointed assistant to **E. T. Sproull,** president of Brainard Steel Corp., Warren, Ohio. He was associated with the Truscon Steel Co. in various capacities from 1925 to 1930, when he was sent to Japan to serve as works manager of the Oriental Steel Products Co., a Truscon subsidiary. He returned to this country in 1937 and served for a time as coordinating engineer with Truscon.

• **Harry J. Starke** has joined the Chicago staff of William Jessop & Sons, Inc., New York, and will assist **Thorvald L. Haines,** district manager.

• **C. B. Cramer** has been made direct factory representative in the St. Louis territory for the Plymouth Locomotive Works, division of the Fate-Root-Heath Co., Plymouth, Ohio. He will make his headquarters at 4620 McPherson Avenue, St. Louis.

• **H. J. French** and **T. N. Armstrong,** metallurgists of the development and research division of the International Nickel Co., New York, have been awarded the Lincoln gold medal for 1940 by the American Welding Society for their paper "Weld Hardening of Carbon and Alloy Steels" presented at the National Metal Congress last year.

Obituary

• **J. Philip Jayme,** who had been identified with the Crucible Steel Co. of America for 59 years, died at his home in Bronxville, N. Y., on Oct. 18, aged 75 years. He entered the employ of the company as a receiving clerk at the LaBelle works in Pittsburgh and progressed through various capacities until he was made manager of that works in 1901. In 1921 he was transferred to the company's executive offices in New York, where he was active until a few months ago. He was one of the oldest Crucible Steel officials both in years and length of service.

• **Clement Biddle Wood,** retired president of the Alan Wood Steel Co., died at his home at Conshohocken, Pa., on Oct. 5, aged 62. Mr. Wood retired a year ago from the company of which his grandfather was the founder. In 1930 he retired as captain of the First City Troop after serving on the Mexican border and in France. During the World War Mr. Wood was commissioned a major in the First Battalion. A graduate of the Harvard Law School and the University of Pennsylvania Law School, he retired recently from active law practice with the firm of Morgan, Lewis & Bockius.

• **Paul G. Wiegert,** former general manager of W. S. Tyler Co., Cleveland, and more recently eastern representative for the O'Neill Wire works, Port Chester, N. Y., and Newark, Ohio, died Oct. 3 at his home in Lakewood, Ohio.

• **Sir Harold Carpenter,** who held the Chair of Metallurgy at the Royal School of Mines, London, for over 25 years, died recently at Swansea, Wales, at the age of 65 years. He was a past-president of the Institute of Metals and of the Institution of Mining and Metallurgy. In 1938 he was made an honorary member of the American Institute of Mining and Metallurgical Engineers in recognition of his distinguished achievements in metallurgy.

• **Charles B. Brainerd,** 79, a director and former secretary of the National Screw & Mfg. Co., Cleveland, died Oct. 13 after an illness of three weeks. He became affiliated with the company in 1890. His father, Jesse K. Brainerd, was a co-founder. Mr. Brainerd retired from active business in 1917.

• **Emanuel Bauer,** head of the Hilb & Bauer Metals Co., Cincinnati scrap broker and dealer, died last Friday at Jewish Hospital in Cincinnati. Mr. Bauer was 70 years old. He was a life-long resident of Cincinnati and had operated the metal company which had been founded by his father.

THE LATE H. H. Timken, Sr., chairman of the board of the Timken Roller Bearing Co., whose death was announced in these columns last week.

• **Max Rotter,** aged 73, former vice-president of the Engineers' Society of Milwaukee and vice-president in charge of engineering of the Busch-Sulzer Brothers Diesel Engine Co., St. Louis, died in that city, Oct. 6, after a short illness. He was born in London and came to this country in 1891. He was chief engineer for the Allis-Chalmers Mfg. Co., specializing in steam turbines and large gas engines. He joined Busch-Sulzer in 1911 as chief engineer.

• **Robert M. Jones,** for many years treasurer of Chandler & Farquhar Co., Boston, died at his home in Somerville, Mass., Oct. 5, aged 90 years.

• **Arthur Patch Homer,** consulting engineer and special envoy of the United States Navy Department when President Roosevelt was Assistant Secretary of the Navy, died at West Townsend, Mass., Oct. 10. Mr. Homer was born in Galveston 64 years ago. For some time he was associated with the New York Shipbuilding Co. in New Jersey, and later with the Fore River branch of the concern where he was assistant to the president. He later established his own business designing and building boats. Prior to his retirement a few years ago he was president of the Power Transmission Co., Boston.

• **Noble J. Ross,** one of the founders of the Beloit Iron Works in 1885, died at his home in Beloit, Wis., Oct. 10. He was a trustee of Beloit college and president of the Beloit YMCA for 30 years. He was 86 years old.

• **William A. Shepard,** sales manager for the American Fork & Hoe Co., Cleveland, died Oct. 8, aged 65 years. He became sales manager of the company eight years ago after it acquired the Kelly Axe & Tool Co., of Charles Town, W. Va., of which he was vice-president.

• **Gottlieb F. Kroner,** pioneer business man of LaCrosse, Wis., president of the LaCrosse Steel Roofing & Corrugating Co. and for many years head of the Kroner Hardware Co., died Sept. 23 at a LaCrosse hospital following a brief illness. He was 73 years old.

• **Paul A. Topel,** small tool salesman in the Chicago office of the Brown & Sharpe Mfg. Co. for nearly 25 years, died suddenly on Oct. 4, aged 59 years.

• **Robert S. McMannus,** Buffalo fabricator and builder of many of the city's largest schools, plants and office buildings, died suddenly at his home on Oct. 19, aged 57 years. Born in Hamilton, Ont., where he received his schooling, McManus came to the United States in 1908 after employment with the Dominion Bridge Co. and the Grand Trunk Railroad. For a time he served as superintendent for the Canadian Bridge Co. and from 1911 to 1915 was first vice-president and later president of the Northern Steel Construction Co. He started in the construction business alone in 1915 and in 1919 incorporated the R. S. McMannus Steel Construction Co., serving as president until his death.

Metal Working Activity

. . . Latest Data Assembled by The Iron Age

From Recognized Sources. In Net Tons.

	Sept. 1940	August 1940	Sept. 1939	9 Months 1940	9 Months 1939
Steel Ingots:					
Monthly output[a]	5,895,232	6,033,037	4,769,468	46,201,463	33,535,012
Average weekly output[a]	1,377,391	1,361,859	1,114,362	1,180,416	859,872
Per cent of capacity[a]	90.75	89.72	72.87	77.77	56.23
Pig Iron:					
Monthly output[b]	4,176,527	4,238,041	3,223,983	33,552,113	22,867,049
Raw Materials:					
Coke output[c]	.....	4,959,973	3,979,521	*36,149,369*	29,698,351
Lake ore consumed[d]	6,352,548	6,384,832	4,184,884	49,536,393	28,074,239
Scrap iron consumed[r]	4,341,120	4,444,160	3,380,160	33,131,660	23,682,480
Castings:					
Malleable, orders[e]	.....	52,994	64,732	*316,444*	327,791
Steel, orders[e]	.....	.....	96,687	.....	398,474
Finished steel:					
Trackwork shipments[a]	5,496	6,480	4,916	61,150	49,597
Fabricated shape orders[f]	.....	109,918	118,020	*913,648*	988,575
Fabricated plate orders[e]	.....	.....	39,751	.....	269,980
U. S. Steel Corp. shipments[g]	1,392,838	1,455,604	1,086,683	10,433,727	7,556,087
Fabricated Products:					
Automobile production[h]	300,000**	75,873	188,757	3,036,104**	2,459,973
Steel furniture shipments[e]	.....	.....	2,006,508	.....	16,070,563
Steel boiler orders[e] (sq. ft.)	.....	1,274,940	1,752,243	*8,513,989*	8,653,259
Locomotives ordered[i]	57	65	52	358	213
Freight cars ordered[i]	9,470	7,645	24,231	33,486	33,623
Machine tool index[j]	94.9	93.3	74.6	92.7†	63.4
Foundry equipment index[k]	161.2	165.4	*	158.7†	*
Gear sales index[s]	183	191	126	139.8†	95.9
Non-Ferrous Metals: (U. S. only)					
Lead shipments[l]	.....	51,643	59,889	*372,926*	379,768
Lead stocks[l]	.....	43,321	97,473	.....	.....
Zinc shipments[m]	66,824	64,065	69,424	502,278	407,770
Zinc stocks[m]	30,965	44,670	95,615	.....	.....
Tin deliveries[n]	12,779	13,966	5,656	91,632	52,214
Refined copper deliveries[o]	96,485	96,383	*	682,961	*
Refined copper stocks[o]	185,313	198,730	*	.....	*
Exports:					
Total iron and steel[p]	.....	1,402,075	575,613	*6,688,732*	4,278,582
All rolled and finished steel[p]	.....	495,263	167,674	*2,585,315*	1,234,176
Semi-finished steel[p]	.....	411,619	36,319	*1,497,360*	139,888
Scrap[p]	.....	355,991	327,724	*2,164,225*	2,741,334
Imports:					
Total iron and steel[p]	.....	2,105	29,874	*45,695*	266,047
Pig iron[p]	.....	882	4,176	*7,724*	29,423
All rolled and finished steel[p]	.....	769	8,342	*11,865*	144,670

Data in italics are eight months' totals.

Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] Preliminary estimates by THE IRON AGE—Final figures from Bureau of the Census, U. S. only; [i] *Railway Age;* [j] National Machine Tool Builders Association; [k] Foundry Equipment Manufacturers Association; [l] American Bureau of Metal Statistics; [m] American Zinc Institute; [n] New York Commodity Exchange; [o] Copper Institute; [p] Department of Commerce; [r] Institute of Scrap Iron and Steel; [s] American Gear Manufacturers Association.

* Not available. † Monthly averages. ** Estimated.

The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	Oct. 22, 1940	Oct. 15, 1940	Sept. 24, 1940	Oct. 24, 1939
Flat Rolled Steel:				
(Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.00
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.00
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Tin and Terne Plate:				
(Dollars Per Base Box)				
Tin plate	$5.00	$5.00	$5.00	$5.00
Manufacturing ternes	4.30	4.30	4.30	4.30
Bars and Shapes:				
(Cents Per Lb.)				
Merchants bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Wire and Wire Products:				
(Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails:				
(Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel:				
(Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Wire Rods and Skelp:				
(Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	1.92
Skelp (grvd.)	1.90	1.90	1.90	1.90

	Oct. 22, 1940	Oct. 15, 1940	Sept. 24, 1940	Oct. 24, 1939
Pig Iron:				
(Per Gross Ton)				
No. 2 fdy., Philadelphia	$24.84	$24.84	$24.84	$24.84
No. 2, Valley furnace	23.00	23.00	23.00	23.00
No. 2, Southern Cin'ti	23.06	23.06	23.06	23.06
No. 2, Birmingham	19.38	19.38	19.38	19.38
No. 2, foundry, Chicago†	23.00	23.00	23.00	23.00
Basic, del'd eastern Pa.	24.34	24.34	24.34	24.34
Basic, Valley furnace	22.50	22.50	22.50	22.50
Malleable, Chicago†	23.00	23.00	23.00	23.00
Malleable, Valley	23.00	23.00	23.00	23.00
L. S. charcoal, Chicago	30.34	30.34	30.34	30.34
Ferromanganese‡	120.00	120.00	120.00	100.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

	Oct. 22, 1940	Oct. 15, 1940	Sept. 24, 1940	Oct. 24, 1939
Scrap:				
(Per Gross Ton)				
Heavy melting steel, P'gh.	$21.50	$21.50	$20.50	$22.50
Heavy melt'g steel, Phila.	20.75	20.75	20.625	21.75
Heavy melt'g steel, Ch'go	19.75	19.75	19.75	18.375
Carwheels, Chicago	20.25	20.25	20.25	17.75
Carwheels, Philadelphia	22.75	22.75	22.75	22.25
No. 1 cast, Pittsburgh	21.75	20.25	20.25	22.75
No. 1 cast, Philadelphia	22.75	22.75	22.25	24.25
No. 1 cast, Ch'go (net ton)	17.75	17.75	17.75	16.25
Coke, Connellsville:				
(Per Net Ton at Oven)				
Furnace coke, prompt	$4.75	$4.75	$4.75	$5.00
Foundry coke, prompt	5.25	5.25	5.25	5.75
Non-Ferrous Metals:				
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*	12.00	12.00	12.00	12.50
Copper, Lake, New York	12.00	12.00	12.00	12.50
Tin (Straits), New York	51.625	51.875	50.25	55.50
Zinc, East St. Louis	7.25	7.25	7.25	6.50
Lead, St. Louis	5.35	5.10	4.85	5.35
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	14.00

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 95 to 104 herein.
On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Composite Prices

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Oct. 22, 1940	2.261c. a Lb.	$22.61 a Gross Ton	$20.67 a Gross Ton
One week ago	2.261c. a Lb.	$22.61 a Gross Ton	$20.67 a Gross Ton
One month ago	2.261c. a Lb.	$22.61 a Gross Ton	$20.29 a Gross Ton
One year ago	2.236c. a Lb.	$22.61 a Gross Ton	$20.88 a Gross Ton

	High	Low	High	Low	High	Low
1940	2.261c., Jan. 2	2.211c., Apr. 16			$20.67, Oct. 15	$16.04, Apr. 9
1939	2.286c., Jan. 3	2.236c., May 16	$22.61, Sept. 19	$20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.512c., May 17	2.211c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.236c., May 28	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Summary of the Week

• Ingot production at 95½ per cent, while orders exceed shipments by a wide margin . . . New business this month running well ahead of September's . . . Some products are virtually sold out for remainder of this year . . . Scrap composite unchanged for first time in 10 weeks.

WITH steel ingot production this week rising further to 95½ per cent of capacity, orders continue to accumulate in a volume much above shipments, deliveries are lengthening and backlogs are increasing. Major steel companies are unable to promise deliveries of some products during the remainder of this year unless they come within the preference classification accorded to defense work.

While defense requirements are a direct and indirect influence in current steel bookings, a preponderance of the orders being received are for non-military purposes. Although a huge volume of defense contracts has been awarded at Washington and by ordnance districts and arsenals, the actual ordering of steel is in many instances delayed because of the lack of detailed specifications. Much of this business will necessarily go over into first quarter or later.

Integrated steel companies are now in a position where all of their semi-finished steel has been earmarked for the remainder of the year either for their own finishing departments or for outside sale. Although all finishing departments are now working at maximum capacity, the semi-finished steel that is not required in one department is used in another. Some steel companies are trying to augment their supplies of semi-finished steel by buying from other mills, and negotiations are also being carried on for the purchase of pig iron from other producers. To forestall a possible shortage of coke, the coke-making subsidiary of the United States Steel Corp. has put an additional large block of beehive ovens in the Connellsville region in service.

THE pressure that steel companies are exerting to obtain maximum production has thus far prevented any shortage of steel among manufacturing consumers, but deliveries on some products are lengthening so rapidly that those who have not been forehanded in building adequate inventories may feel the pinch later on. It is now the common belief in the steel industry that by the first quarter some of the so-called non-essential steel uses will be curbed somewhat because of the preference that will necessarily be given to the most essential requirements.

At Pittsburgh orders in the past week have been received in a volume that resembled the busiest period last fall. A Chicago mill is receiving double the amount of business that it booked in the comparable part of September. Hot rolled bars are probably in the greatest demand, with structural shapes and plates coming a close second. Sheet tonnage is increasing rapidly. Some automobile companies are now being quoted eight weeks' delivery.

Many defense projects are in the construction stage, which accounts for the continuing large volume of fabricated structural steel projects. Awards of 39,050 tons are accompanied by new jobs totaling 50,000 tons, and in this work airplane and airplane engine plants are outstanding. The largest award is 8400 tons for a plant for the Republic Aviation Corp., Farmingdale, L. I., and the largest single inquiry is 12,000 tons for the Wright Aeronautical Corp. plant at Lockland, Ohio, while the Curtiss-Wright Corp. has two new projects totaling 14,500 tons.

SHELL steel is one of the large items in current business, even though it will take much longer to make guns than shells. In the East 59,000 tons has been placed and 41,000 tons is pending. About 100,000 tons for contractors in the Chicago district probably will not be placed until about the first of the year.

The automobile industry, pushing ahead to its highest production of the year, will consider at a meeting Friday plans to convert some of the facilities to the manufacture of airplane parts. Tooling for 1942 cars may also be undertaken at an early date, as the industry is subordinating its model changeover program to national defense needs.

Railroad buying of new equipment has been light in the past weeks, but reservations of rail tonnages are being made, usually without official announcement.

For the first time in 10 weeks THE IRON AGE scrap composite price has failed to show an increase. There have been some changes in prices of secondary grades, but declines have been more numerous than advances. Conferences recently held in Washington for the purpose of preventing a runaway scrap market have apparently been fruitful, for the time being at least.

Japan has been sounding out the American market for ingots, slabs and finished steel, but in their present sold-up condition mills are not much interested in the business, especially in view of the possibility that steel may eventually be added to the Japanese embargo list.

The Industrial Pace . . .

PUSHED UPWARD BY production increases in all components, but especially by record-breaking expansion in heavy construction, activity in the durable goods industries, as measured by THE IRON AGE index of capital goods activity, resumed its upward climb during the past week, the index rising to 109.8, exceeding the previous 11-year high established three weeks ago by 2.1 points. The latest index compares with 106.7 in the previous week, 103.8 a month ago, and 98.6 in the corresponding period of 1939.

A substantial contributor to the week's gain was the automobile series. Physical output was 114,672 units, as compared with 108,457 units in the week previous, a larger than seasonal advance which raised the component 3.7 points to 109.0.

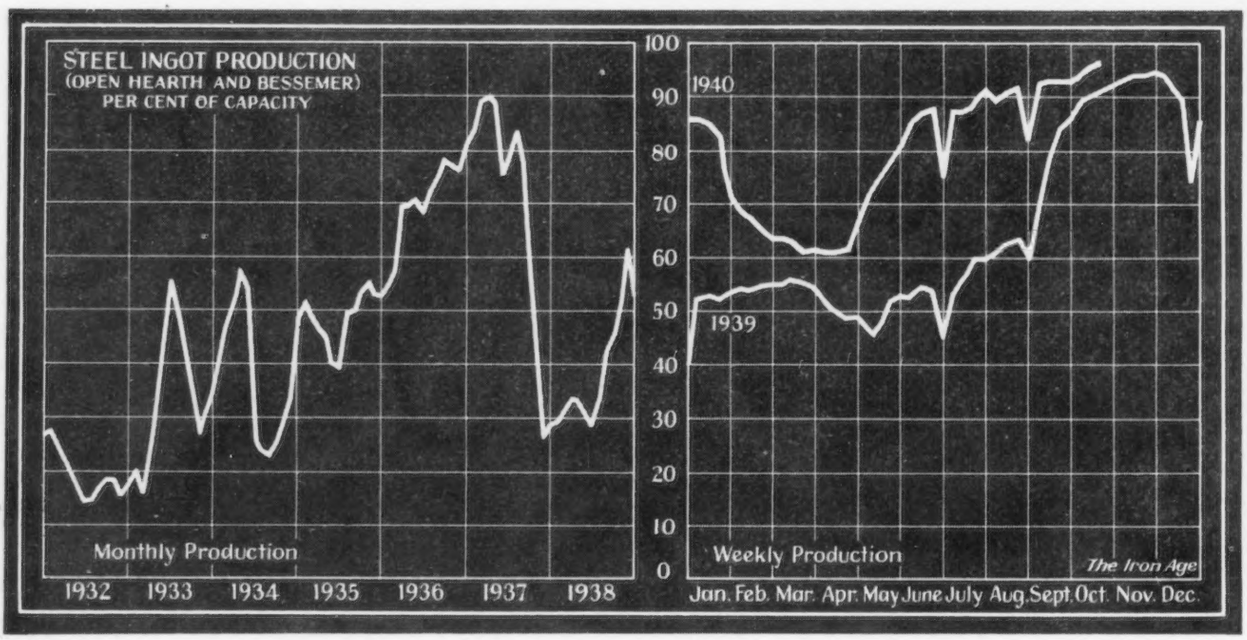
The heavy engineering construction component stands at 120.2 for the past week, up 8.2 points from the previous period. An upsurge in public and privately financed heavy construction work brought the past week's total to $238,793,000, the highest week's volume on record. The new figure eclipses the previous high, established in the week ended March 20, 1930, by 31 per cent. A combination of the highest weekly public volume of awards ever recorded, and the highest volume of private awards since June 24, 1937, is responsible for the new all-time peak.

Among the larger awards made during the week were $23,600,000 for Navy construction at the plant of Bethlehem Steel Co., Bethlehem, Pa., $11,000,000 for a nylon plant in Virginia, and $15,000,000 for an aluminum plant in Alabama. An award for buildings, machine tools and furnaces costing $5,350,000, to be built for the Navy Department at Charleston, W. Va., and Homestead, Pa., and operated by Carnegie-Illinois Steel Corp. was also placed. Shipways and shipbuilding slips contracts for the Navy Department awarded in the week totaled about $26,000,000.

Totaling 1,392,838 net tons, shipments of finished steel by subsidiaries of the U. S. Steel Corp. in September were the highest for any September since 1920, when 1,422,000 net tons were shipped. The indicated decline of 62,766 tons from the August total of 1,455,604 tons shipped was due principally to the shorter working time in September. Allowing for the Labor Day holiday, on a per cent of finished steel capacity basis, the September rate of 87.8 shows only a fractional decline from 88.6 in August.

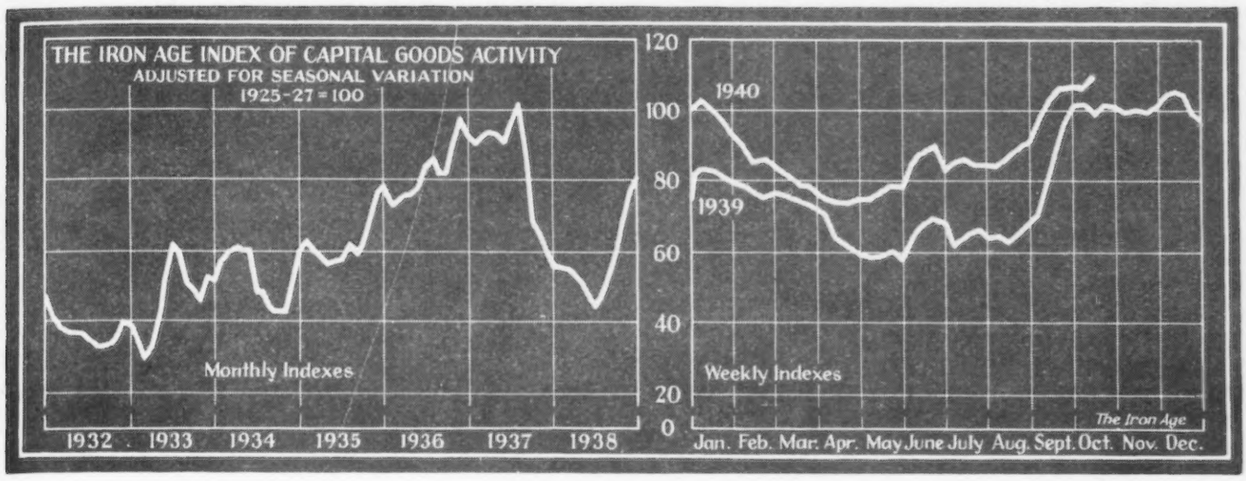
A leveling off in the trend of scrap prices, occurring coincidentally with the Washington conferences which were held with the expressed intent of preventing a runaway market such as occurred in the World War, has been noticed in recent weeks. The moderating tendency, occurring after nine weeks of rising prices in which THE IRON AGE composite advanced $2.45, began at a point 70c. above the previous peak of the current year, but $1.85 below the high point of 1939. In 1917, the peak of the World War rise, the composite reached a peak of $31.50 in September and averaged $29.19 for the year.

Steel Production at All Time High



District Ingot Production, Per Cent of Capacity		Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Buffalo	Wheel-ing	Detroit	Southern	S. Ohio River	West-ern	St. Louis	East-ern	Aggre-gate
	Current Week . .	94.0	98.0	94.0	94.0	87.0	104.5	104.0	100.0	105.0	109.0	72.0	96.5	80.0	**95.5**
	Previous Week . .	92.0	99.0	94.0	94.0	87.0	104.5	104.0	95.5	105.0	95.0	72.0	96.5	78.0	**94.5**

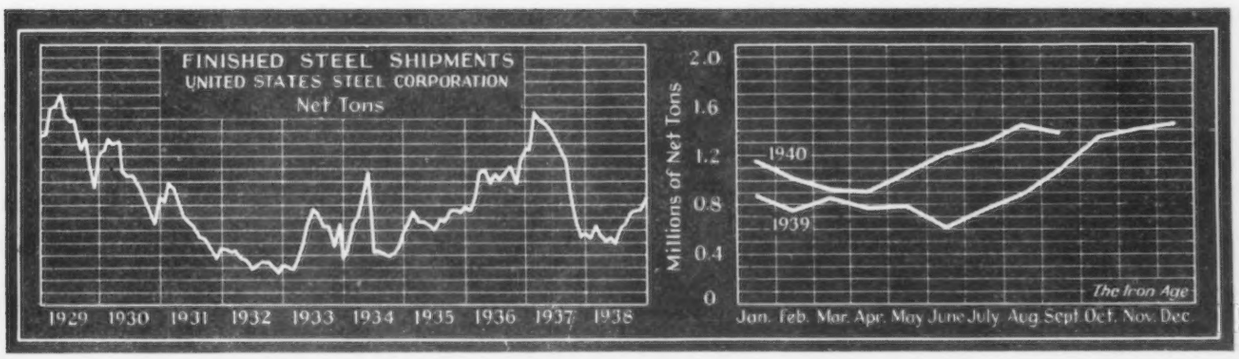
Capital Goods Index Resumes Upward Movement



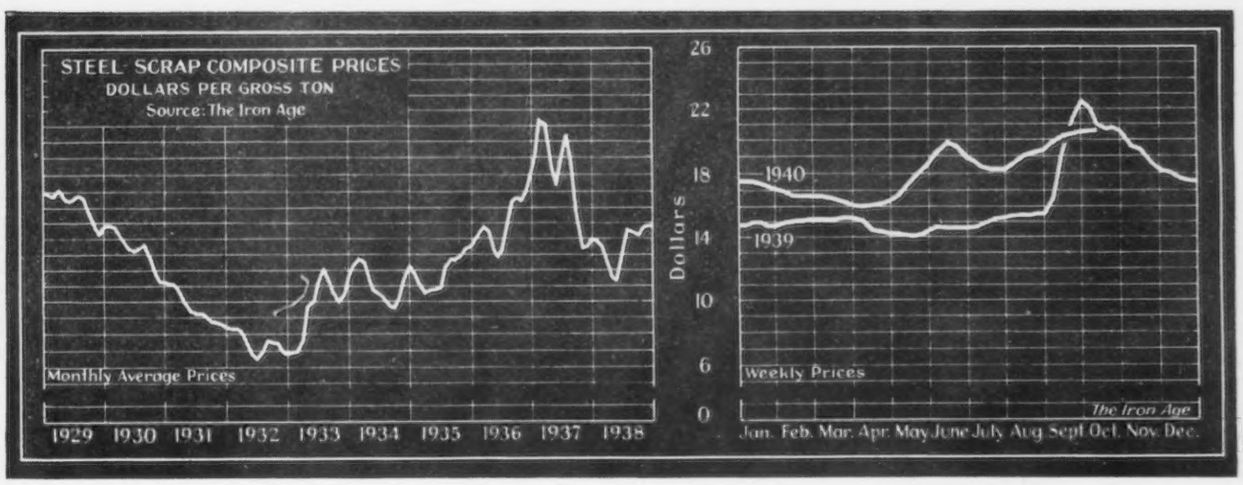
▼Component Week Ended ➤	Oct. 19	Oct. 12	Sept. 21	Oct. 21 1939	Oct. 19 1929
Steel ingot production[1]	135.9	133.7	135.8	129.3	113.1
Automobile production[2]	109.0	105.3	99.2	111.3	120.3
Construction contracts[3]	120.2	112.0	99.0	74.4	106.9
Forest products carloadings[4]	74.5	73.4	72.2	69.7	115.0
Pittsburgh output and shipments[5]	109.6	108.9	112.9	108.3	116.6
COMBINED INDEX	109.8	106.7	103.8	98.6	114.4

Sources: [1] THE IRON AGE; [2] Wards Automotive Reports; [3] *Engineering News-Record;* [4] Association of American Railroads; [5] University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended Oct. 12. Other indexes cover week of Oct. 19.

U. S. Steel September Shipments Highest Since 1920



Scrap Prices Show Tendency to Level Off



Market News

. . . THE WEEK'S ACTIVITIES IN IRON AND STEEL

New Business

. . . Orders piling up in heavier volume, backlogs larger

Total order volume in the past week at PITTSBURGH has approximated that of the most active weeks last fall. Although buying continues on an orderly basis, there are numerous signs that some consumers at least are becoming apprehensive concerning availability of supplies when needed. Export buying by the British is considerably less than it was last July, although the difference has been more than made up by the substantial increase in domestic buying which is characterized by wide diversification. Hot rolled bars lead the list of steel products in greatest demand, with plates and shapes following a close second, and sheets definitely being demanded in increasingly large tonnages.

While PITTSBURGH steel mills are booked somewhat ahead in major steel products, some room remains on December rolling schedules. However, at the rate new business is being received, maximum steel production over the remainder of the year will soon be earmarked. Bookings so far this month are comfortably ahead of the same period in September, increases ranging from 10 to 30 per cent.

New business at CHICAGO continues to accumulate in a volume greater than shipments, and backlogs are building up steadily. Steelmakers note a continuing increase in first-quarter bookings, with inventories of about 90 days characterizing buyers' wishes. One mill reports its business for October exactly twice as much as for the same period in September. The past week saw inquiries and orders at a peak for most producers in that district. Another blast furnace was blown in last week by Carnegie-Illinois, putting 11 out of 12 in operation in the CHICAGO district.

Defense orders are probably less a factor there than in other sections of the country, indicating that general domestic demand from a broad front is very strong. Railroad buying and automotive sources are still leaders in demand, but others, especially users of structural steel, are helping to maintain a strong market. Both inquiries and orders for piling are increasing, mostly for government projects. Fabricators, forgers and warehouses all report increasingly strong business. A slight upward movement in tin plate was noticed, though nothing to indicate hopes for a general strengthening before the first of the year.

Sales of steel are still increasing at CLEVELAND and YOUNGSTOWN, and some production facilities are practically sold out for the remainder of this year while other mill schedules are approaching the full-up stage. Several producers are now forced to limit orders which cannot be fitted easily into production schedules. Specifications involving roll changes or other extra production costs are apt to be rejected unless they carry a priority rating. In view of the strong situation, CLEVELAND steel sellers occacionally are amazed to find buyers who apparently do not realize that building up inventories will be difficult.

Orders at CLEVELAND and YOUNGSTOWN during October apparently will be the biggest of any month this year, but the record may not last long, as prospects for November are very promising. In addition to hot rolled carbon bars, cold finished bars, alloy steel and one or two other items, considerable tonnage in fastenings for railroad trackage has been received recently.

A strong demand for practically all steel products continues in the NEW YORK area, and new bookings continue to outrank shipments. Delivery periods, though much longer than was the case a month ago, are still determined largely by the characteristics of the material wanted. Support for the NEW YORK market comes from numerous, widely diversified sources. Warehouses, ship and barge builders, domestic oil tank makers, concrete mixing equipment makers, oil companies and light stamping plants all are contributing to current bookings.

Deliveries on universal mill products are quoted by one eastern Pennsylvania producer at 10 to 12 weeks, while another mill is able to make deliveries in four weeks. The general run of flat rolled stainless items with not too highly finished surface can be shipped in from four to six weeks. Alloy bars in some cases run beyond 10 weeks.

Japanese interests have indicated interest in substantial quantities of ingots, slabs and finished steel for delivery in the first half of November, but there is a general inclination among producers to avoid this business.

New bookings at all mills in the PHILADELPHIA district have shown considerable improvement over those of September, and in most cases are in excess of shipments. A steadily widening program of plant expansions to accommodate heavier production schedules due to the defense program has resulted in a demand for structural steel, which, in addition to plate and bar business, continues to predominate on order books.

Orders for most products show little change at BIRMINGHAM. The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. is scheduled to reopen Nov. 4 with a backlog of between 60,000 and 65,000 tons. It has been shut down since Sept. 6.

A tendency on the part of some federal agencies to award defense construction contracts before structural design has been worked out is causing confusion among steel suppliers as to amounts to be required in the near future.

Pig Iron

. . . Trend of orders and shipments continues upward

The possibility that some steel companies may be obliged to augment their own supplies of pig iron by buying from merchant producers is being freely discussed in the trade. Negotiations are said to be in progress in one or two important instances.

Meanwhile, the trend of pig iron orders and shipments is upward. Merchant producers are drawing

more heavily on their reserve stocks, which may be greatly depleted within a few months if shipments continue to expand.

October shipments are quite generally running ahead of those of September. Some producers, in fact, expect to establish all-time records this month.

Foundries are increasing their melt as many of them extend their work week to six days.

In PHILADELPHIA two large inquiries, one for 8000 tons of foundry grade and the other for 3000 tons of malleable grade, are current.

Semi-Finished Steel

. . . Supplies pretty well earmarked to end of year

Total demand so far this month at PITTSBURGH is running somewhat ahead of a month ago and capacity for open market material is fairly well booked up to the end of this year. Some integrated mills continue to be in a position where they would like to supplement their own semi-finished supplies if possible. Export demand continues strong but total bookings from this source are not as heavy as last July. Steel makers, however, look for a steady pickup in English purchases over the next few months.

Specifications for semi-finished steel at CHICAGO for the month are far ahead of the preceding period, placing this type of business at the front with bars and plates as the most active in that district. Forgers are all working full or overtime with about two months' work ahead of them.

CLEVELAND reports that semi-finished sales this month up to Oct. 21 were running below those of comparable part of September, apparently because of the heavy September coverage and because some integrated mills are clamping down on outside commitments, especially in rerolling billets.

In NEW YORK 59,000 tons of shell billets have been placed by companies having U. S. contracts, principally the American Car & Foundry Co., and 41,000 tons additional is pending. A large tonnage of billets for 9.2 in. shells for the British is also pending.

Iron Ore

. . . 44,228,922 tons of Lake Superior ore consumed to Oct. 1

Iron ore consumption during September by furnaces depending principally on Lake Superior ore totaled 5,671,918 gross tons against 5,700,743 tons in August, according to the latest report of the Lake Superior Iron Ore Association, Cleveland. In September, 1939, consumption was 4,184,884 tons. For this year to Oct. 1 cumulative consumption was 44,228,922 tons against 28,074,239 in the corresponding part of 1939.

Ore on hand at furnaces and Lake Erie docks Oct. 1 totaled 37,090,053 tons against 32,934,665 tons a month earlier and 35,853,173 tons a year previously. The association reports 159 furnaces using lake ore were in blast Sept. 30 with 30 stacks idle, a gain of four during September.

For the second consecutive month the American Great Lakes iron ore fleet was operating at 100 per cent of capacity on Oct. 15, according to C. C. Lindeman of M. A. Hanna Co., Cleveland.

Plates

. . . Heavy bookings cause lengthening of deliveries

Structural and other plate tonnage at PITTSBURGH continues to be booked at a rapid rate with plate capacity fairly well sold out for the rest of this year, although items not in the wide plate category can probably still be obtained for delivery some time in December. Ship building, national defense structures and miscellaneous demand indicate record level activity of plate mills for some time to come.

Closely following last week's announcement of a sharp lengthening in sheared plate deliveries, a CHICAGO mill now reveals that deliveries have increased from seven to eight weeks up to 10 to 12 weeks in the past seven days. Fabricators in that district are all working full time, and backlogs are building up steadily.

Heavier shipyard purchases supplemented by strong miscellaneous buying resulted in substantial tonnages booked in the PHILADELPHIA area over the past week. Plants working on defense orders report an increased volume of business during the period.

Plate bookings in NEW YORK continue at a very high level with very few sellers able to offer deliveries before the last week of December. Demand is on a wide foundation with practically all district consumers, including the warehouses, participating in the buying. A few first-quarter commitments have been made to be billed at prices in effect at time of shipment. The new export price of 2.35c., f.a.s., is apparently not meeting with any opposition.

Structural Steel

. . . Awards 37,550 tons, new projects total 50,000 tons

Fabricated structural steel awards advanced to 37,550 tons from 33,070 tons a week ago. The largest lettings are 8400 tons for a plant for the Republic Aviation Corp. at Dallas, Tex.; 2600 tons at Anaconda and Butte, Mont., for converter plants for the Anaconda Copper Mining Co.; 2500 tons for the Aluminum Co. of America at Vancouver, Wash.; 2500 tons at Quonset Point, R. I., for an assembly and repair shop for the Navy Department; 2200 tons for a nylon plant at Martinsville, W. Va., for E. I. du Pont de Nemours & Co.; and 2000 tons at Hawthorne, Nev., for naval ammunition depot buildings.

Structural steel projects at 50,000 tons are the second highest this year. New inquiries include 12,000 tons at Lockland, Ohio, for an assembly and machine shop for the Wright Aeronautical Corp.; 8000 tons for a factory and office building at Columbus, Ohio, and 6500 tons for a factory and office building at Robertson, Mo., both for the Curtiss-Wright Corp.; 5500 tons for a Mississippi River bridge at Jefferson Barracks, Mo.; 5400 tons at Wilmington, Ill., for a TNT plant for E. I. du Pont de Nemours & Co.; 3500 tons for four army hangars at Howard Field in the Canal Zone, and 1700 tons at Wichita, Kan., for three aircraft manufacturing buildings for the Stearman division of the Boeing Aircraft Co.

Merchant Bars

. . . Orders expanding from widely diversified consumption

Led by a widely diversified list of miscellaneous manufacture, demand for hot rolled bars at PITTSBURGH again expanded last week and orders so far this month are running somewhat ahead of a month ago. Deliveries continue to be extended and on some sizes and shapes rolling schedules are filled for the rest of this quarter. Automobile buying continues moderately heavy and direct and indirect national defense requirements are steadily increasing. Cold finished bar sales have expanded recently and order volume so far this month is moderately ahead of the same period in September.

Specifications at CLEVELAND up to Oct. 19 were approximately 20 per cent ahead of the comparable September period. Production is higher in the Valleys district where breakages in equipment during September made necessary the shifting of mill schedules temporarily. One inquiry for 16,000 tons of cold drawn bars for shell work is being circulated at CLEVELAND.

The 100,000 ton inquiry for shell steel announced several weeks ago at Chicago will generally not be placed until the first of the year.

Railroad Buying

. . . Lehigh Valley orders 750 cars, Burlington to build 1000

Activity in the railroad market in the past week was somewhat below recent levels, but in view of the inquiries still pending and other prospective equipment programs the let down will be of short duration.

Largest purchase reported in the week was 750 cars for Lehigh Valley, with 500 box cars being awarded to Pressed Steel Car Co. and 250 gondolas placed with Bethlehem Steel Co. About 9000 tons of steel will be required for this order. Chicago, Burlington & Quincy is planning to construct 1000 box cars in company shops. Kansas City Terminal Railway Association has purchased three diesel switch locomotives from American Locomotive Co. and Wheeling & Lake Erie is seeking court authority to purchase seven freight locomotives from American Locomotive Co.

Pacific Fruit Express is seeking bids on 1000 refrigerator cars and Navy Department has issued an inquiry for 55 cars for service at various naval ammunition depots.

Chicago & North Western has ordered 11,200 tons of rails from Carnegie-Illinois Steel Corp. and 4800 tons from Inland Steel Co.

Erie railroad has allocated 12,800 gross tons of 131 and 112 lb. rail to Carnegie-Illinois and 2200 gross tons of 131 lb. rail to Bethlehem.

Class I railroads in the first nine months of 1940 put in service 52,685 new freight cars, the Association of American Railroads has announced. In the same period last year, 14,704 new freight cars were put in service. The railroads also put in service in the first nine months 265 new locomotives, of which 73 were steam and 192 electric and diesel. Installed in the first nine months last year were 202 new locomotives of which 45 were steam and 157 electric and diesel.

New freight cars on order on Oct. 1, 1940, amounted to 16,892, compared with 18,456 on Sept. 1, 1940, and 23,053 on Oct. 1, 1939.

Reinforcing Steel

. . . New projects 5825 tons

Reinforcing steel awards of 14,100 tons include 4000 tons at Alameda, Cal., for the naval air station; 1200 tons for a bridge between Hartford and East Hartford, Conn., and 1100 tons at Vallejo, Cal., for a housing project.

New reinforcing steel projects call for 5825 tons. The only inquiry of size is 1400 tons for the Panama Canal.

Wire Products

. . . Deliveries on some items impossible to obtain this year

On certain types and sizes of manufacturers' wire deliveries during the remainder of this year are impossible to obtain, reports CLEVELAND. A few other types are approaching the same stage, while in other divisions plenty of capacity exists. Shipments of merchants and manufacturers wire combined are expected to set a new peak for this year during the current month. Orders, while strong, are apparently destined to fall below the previous peak month this year. Wire specifications at PITTSBURGH are being received at an accelerated rate. Wire demand at CHICAGO is strong along the line with fencing, concrete reinforcing accessories, upholstery springs coming in for strong play.

Sheets and Strip

. . . Rolling schedules advancing toward full-up stage

Total sheet sales at PITTSBURGH booked so far this month are well ahead of the volume placed in September. Although automotive buying is not unduly large, tonnages are being placed steadily. Miscellaneous purchases have expanded further in the past week and, while some of this buying is probably for inventory purposes, a definite pick-up in actual sheet consumption has materialized. Deliveries on hot rolled are running from four to six weeks and in some cases as much as eight weeks. Promises on galvanized sheets are somewhat extended and the introduction of this product for national defense purposes seems to indicate a further building up in backlogs.

CLEVELAND reports that rolling mill schedules continued to advance toward the full up state last week, particularly in cold rolled and stainless. Small orders for stainless can still be fitted into fourth quarter schedules, but new tonnage rollings are virtually impossible to arrange. The Rock Island arsenal was scheduled to open bids Thursday, Oct. 24, for 725,000,000 metallic machine gun links, involving 15,000 to 20,000 tons of high carbon cold strip, for delivery over an extended period. Stainless rolling and annealing facilities at CLEVELAND will be greatly expanded by the leading producer there.

A leading producer at CHICAGO extended deliveries this week on wide strip, 2½ in., to 8 in., to three to four weeks from former promises of one to two weeks. This is the first lengthy extension on this product for some time and indicates the steady increase in business of this kind.

Sheet and strip demand in the SOUTHERN OHIO district is adhering to a uniform rate of approximately 100 per cent of mill capacity. This consistent ordering has

now been holding for the past three or four weeks and mill interests report the building of comfortable backlogs. The leading district interest indicates it is still able to take care of emergency deliveries should occasion arise.

Tubular Goods

. . . Standard pipe and mechanical tubing sales expand

Tubular goods sales at PITTSBURGH show little or no change from a week ago, oil country goods being off seasonally, standard pipe reflecting further expansion, and boiler tube and mechanical tubing sales being received in good volume. Line pipe tonnage is only mediocre.

Shipbuilding

. . . 17,000 tons of steel required for submarine tenders

Construction of three submarine tenders costing $50,000,000 and requiring about 17,000 tons of steel has been allocated by the Navy Department to two government Navy yards. The Mare Island (Cal.) yard will build two tenders while the Puget Sound (Wash.) yard will build one.

Tin Plate

. . . Operations at 46% . . . cold reduction mills at 70%

Overall tin plate operations continue unchanged this week at 46 per cent and likewise cold reduction mills remain unchanged at 70 per cent of capacity. Some miscellaneous buying has turned up and some mills have been able to garner orders from can makers for future deliveries and consumption. Aside from one or two exceptions, export buying is still in the doldrums.

Coke

. . . Additional Connellsville ovens started by H. C. Frick Coke Co.

Having already put into operation several weeks ago 400 beehive ovens at its Phillips plant and 247 at its Kyle plant, the H. C. Frick Coke Co., U. S. Steel subsidiary, is now bringing in 120 ovens at its Crossland plant and 250 at its Continental plant, all located in the Connellsville beehive coke region. This latest move on the part of the corporation subsidiary brings practically all of its beehive coke capacity into production. At the present time there are approximately 4400 ovens working in Western Pennsylvania with about 200 to 300 available in case of increased demand.

Although furnace beehive coke is still quoted at $4.50 to $4.75 a ton, small lots have brought a premium over the top figure and when first quarter contracts are made the price may be at a higher level.

Metal Trades Association Develops Apprentice Plan

Chicago

• • • **National Metal Trades** Association is now distributing to industrial plants a comprehensive plan, largely the work of its Chicago branch, for training apprentices. The committee of Chicago industrialists formulating this program was headed by Howard Grant, chairman, Whiting Corp., and included H. L. Bills, Acme Steel Co., P. H. Danly, Danly Machine Specialties, Inc., and Richard Mackay, Jr., Union Special Machine Co.

With defense program requirements increasing, the need for skilled labor is throwing the responsibility for training on the manufacturers themselves. The new Metal Trades program is based on the experience and cooperation of nearly 900 member companies and is designed to bring skilled and semi-skilled workmen into quick production. Along with the training program, which is built for firms training men on a small scale as well as those who instruct large numbers of apprentices, is a job rating appraisement based on an analysis of 20,000 jobs in 215 companies.

Fourteen instruction outlines are available to manufacturers, both members and non-members, and may be obtained from the National Metal Trades Association. Outlines completed so far cover these operation jobs: assembler, drill press—single, multi-spindle or gang, radial drill press, engine lathe, turret lathe, hand milling machine, milling machine, cylindrical grinder, shaper, surface grinder, planer, vertical boring machine, vertical turret lathe, horizontal boring machine. Other outlines are now in process.

National committee on training for the association is composed of Charles H. Edgar, Otis Elevator Co., Yonkers, N. Y., chairman; B. C. Kreuter, American Laundry Machinery Co., Rochester, N. Y.; A. H. Bainton, Brown & Sharpe Mfg. Co., Providence, R. I.; William Finkl, A. Finkl & Sons Co., Chicago.

Steel Seen Able to Meet Farm Tool Demands

Chicago

• • • **Total farm income** of $8,500,000,000 from marketings and $750,000,000 from government payments gives farmers in 1940 the greatest year for buying power since 1918. This was revealed to members of the Farm Equipment Institute by its research director, Harry G. Davis, at the group's convention in Chicago. Changes in farming methods are shifting demand for types of agricultural equipment, making equipment manufacturers alter production schedules to accommodate demand, particularly for new power units and harvesting equipment, the convention was told.

C. W. MacFarlane, president of Minneapolis-Moline Power Implement Co., said that 1941 would be more profitable for the industry than 1940. Clarence B. Randall, vice-president of Inland Steel Co., declared that the steel industry would be able to meet future requirements of the farm equipment industry, despite the heavy steel demands of the United States and Great Britain defense programs.

Milwaukee Training School on 3 Turns

Milwaukee

• • • **The Milwaukee Vocational** school, considered one of the largest in the country, will go on a 24-hr. basis in order to take care of the 25 extra classes necessary and to provide an adequate training program for national defense. Two of the shifts will take care of chiefly from the WPA or jobless rolls of the state employment sersome 325 adult students, drawn vice.

Machine Tools

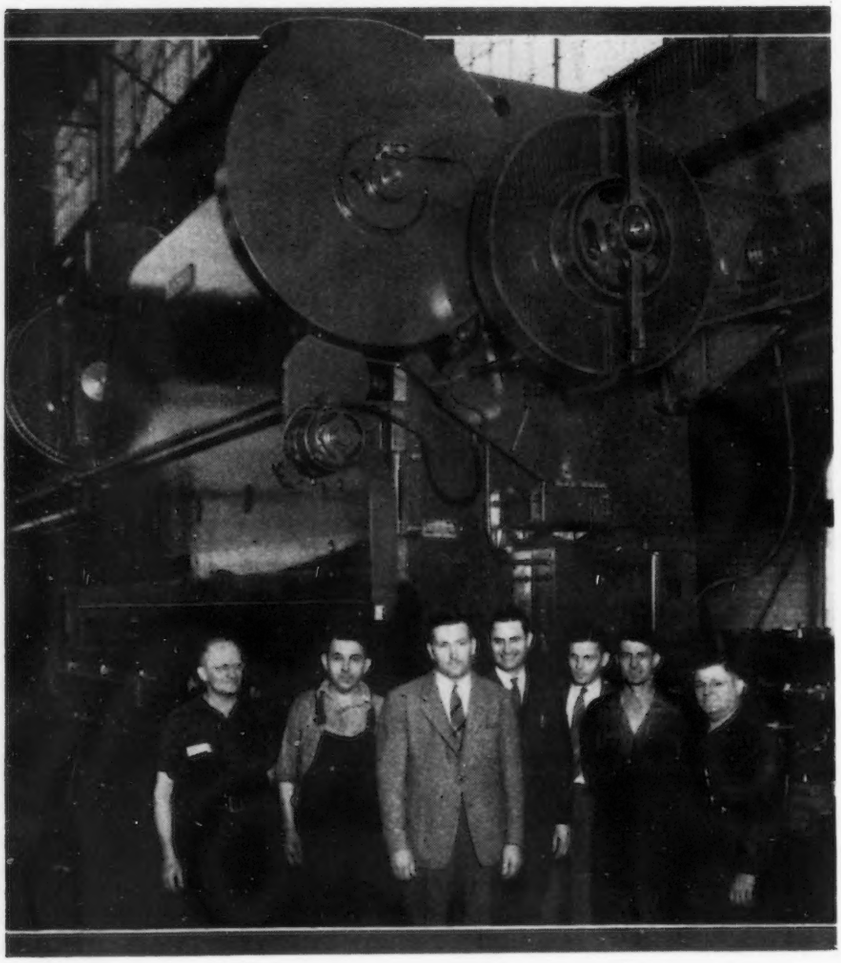
. . . SALES, INQUIRIES AND MARKET NEWS

Industry's Problems Numerous

Chicago

• • • **To understand** the predicament the machine tool industry now finds itself in, consider that this year's volume is five times greater than the yearly average for the past 20 years. Despite modernized production methods and increased facilities, neither of these is adequate to accommodate the present bulge in orders. Profits and prospects of profits are not commensurate with business on hand to ease the current situation. Added to this is an insufficient supply of skilled labor and a jumbled production and delivery schedule due to indefinite priorities. The industry in the greater Chicago area is of the belief that before long, the entire machine tool output will be for defense. Firms in this area manufacturing armament supplies are increasing in number and in their orders of new machinery. One manufacturer has his entire output of horizontal boring machines sold out for 1941. The Rock Island arsenal continues to be the source of sizable orders. Three or four firms are urgently ordering shell turning equipment. Another company in that district which expects a commission to build gun slides, carriages and mounts will place a huge order for new machinery when formal award is made.

ONE OF THE LARGEST PRESS BRAKES ever built for aircraft sheet metal forming has been completed by the Cincinnati Shaper Co., Cincinnati, for the Lockheed Aircraft Corp.'s plant at Burbank, Cal. It is the 340 series x 16 ft. type. The men standing in front of it when it was photographed are (from the left): Walter Leak, chief electrician, and Gustave Siegle of the press brake assembly department, Cincinnati Shaper Co.; M. W. Seavey, manufacturing-engineering department, Lockheed Aircraft Corp.; Jack La Rue, Cincinnati Shaper's advertising department; W. W. Bright, die engineering department, William Franklin, press brake assembly department, and George Diehl, service representative, all of the shaper company.



Study Output Expansion

Cincinnati

• • • **No diminution** in the steady flow of machine tool orders has yet occurred in this market. The problem of adequate production, however, continues to be one of importance and manufacturers are considering various ways of increasing their production. Cincinnati Milling Machine Co. recently sought vacation of a small strip of street near their plant for the purpose of enlarging their present quarters to take care of the business. No definite announcement on the extent of the improvement has yet been made, except that the ground was sought to manufacture machinery to produce guns and small arms.

Boring Mill Demand Heavy

Cleveland

• • • **All phases** of the machine tool industry here, including orders, production and shipments, continue at a peak. All the principal producers have greatly extended backlogs, including machines for shipment in the latter part of next year, but here and there during the past week it has been possible to fit into the schedules an occasional order for shipment in the spring and summer months of 1941. Only a few producers are booked solidly through next year. Horizontal boring mills and certain types of milling machines are among the types of equipment where pressure has been greatest. In general, however, the industry is in a more favorable production position than ever before and still is expanding on all sides. Makers of forging machinery and other heavy equipment report the same sort of brisk order volume that other manufacturers of metal-working machinery have experienced.

Non-Ferrous Metals

. . . MARKET ACTIVITIES AND PRICE TRENDS

New York, Oct. 22—Principal feature of the non-ferrous markets in the past week was another advance of $5 a ton in the price of lead. Consumer demand for all metals, with the exception of tin which remained at the same level throughout the week, was in good volume. Sellers, however, did not encounter quite so much buying pressure, especially in zinc, as had been the case in the previous week. Copper was still being rationed, but rather liberally, and a considerable quantity was disposed of during the week. A price of 12c. a lb., delivered Connecticut Valley, is being quoted by all major producers. The monthly sales total for October, if orders are booked at the present rate for the rest of the month, is expected to compare favorably with September.

Lead

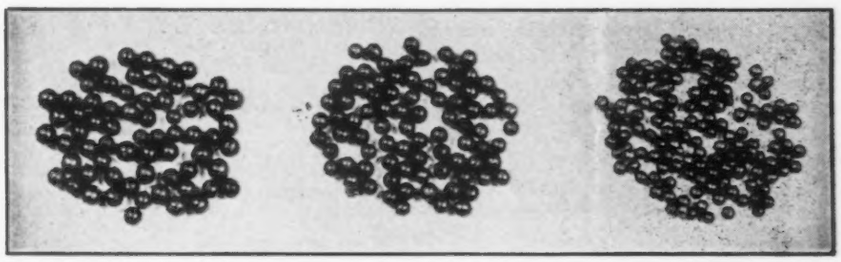
Confronted by an insistent demand for metal, which showed no signs of abating, and backed by steadily diminishing supplies, leading producers on Wednesday of the past week raised their prices from 5.25c. to 5.50c. a lb., delivered New York. For some time previous sellers had frequently sold out their quotas and been forced to carry some business over a day. Sales immediately following the price advance were in good volume and the market was strongly supported. Toward the end of the week business became more spotty but buyers opened the present week on a strong note. Bulk of business taken was for November delivery, that month now being about 70 per cent accounted for. Expectations on the part of many sellers, based on the dwindling stock situation, that Mexican or other foreign lead might prove to be a factor of increasing importance in the domestic market were borne out when it was learned that Mexican material has already been used in small quantities to fill requirements in the East, and that Western stocks were being to some extent reserved for consumers in the Middle West.

Tin

Culmination of negotiations to obtain Bolivian ores for smelting operations in this country as a national defense move has had no effect on the market here. The time element involved before such metal will actually be on the market, and the question of the success of such an enterprise in providing the high grade of tin demanded by American consumers, will probably delay any reaction to this movement until some time after the plant is in actual operation. Buyers' interest declined rather sharply early in the past week, the market declining to 51.625c. a lb., New York, and remaining there through the opening of the present week. Activity was spasmodic and confined mainly to futures buying. Arrivals of tin so far in October have been considerably less than for the same period in September.

Zinc

Consumer pressure in the market appeared to have eased somewhat in the past week and the more or less tense situation which had been characteristic for several weeks became more relaxed. Available supplies were no larger but much of the buying attention became focused on the problem of prompt shipment rather than the acquisition of additional metal. Sales in the week were down to 4000 tons, compared with 9200 tons in the previous week, but shipments were up to 6665 tons from 6200 tons. Backlogs now total about 99,420 tons. In a quieter market supplies are still being rationed, preference being given to the most pressing needs.



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A shot or grit that will blast fast with a clean finish.

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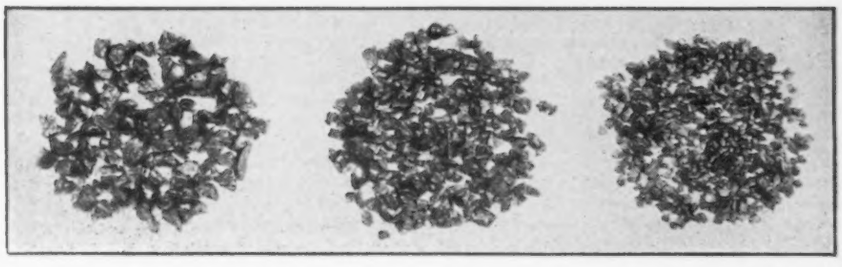


Scrap . . . MARKET ACTIVITIES AND QUOTATION TRENDS

The Iron Age composite this week is unchanged at $20.67, the first time in 10 weeks it has failed to show an increase. The culmination of the leveling off process which began simultaneously with the inauguration of conferences between scrap sellers, users and government officials, finds the composite $2.50 above the low point of the recent weakness, but $1.83 below the peak of 1939. While the immense requirements of domestic consumers are providing the market with heavy support, it is notable that several districts report the development of a cautious attitude. A number of minor changes, both up and down, have been made in quotations on secondary grades, but these changes appear to be primarily in the nature of corrections. A suggestion of what this nation might face if it becomes involved in war can be seen in the efforts being exerted by Canada to expand its scrap supplies. A recent appeal to the citizens of Toronto, a city of about 600,000 population, to contribute to a city-wide scrap collection resulted in an accumulation of 700 tons.

Pittsburgh

The market remains strong with activity restricted. Consumer and broker sales involving No. 1 steel have been made within the range of $21 to $22 and this grade remains quotably unchanged this week. A heavy surge of production scrap has probably done more than any one factor to stabilize prices at current levels. Secondary grades continue strong.

Philadelphia

In a strong market, where mill buying has proceeded at a steady but unhurried pace, prices on prime steel making grades remained unchanged for the week. Use of cast borings as open hearth material advanced the price $1.50 to $14.50 to $15, while stove plate is quoted at $18 flat.

Chicago

For the second consecutive week, scrap prices here are unchanged, with No. 1 heavy melting quoted at $19.50 to $20. Trading is practically at a standstill with consumers indicating a desire to wait and avoid commitments at this time. The market is very firm.

Youngstown

Offerings by dealers confirm published quotations, but mills are reluctant to buy for the present. At least two plants in the district are receiving only small amounts of scrap, four cars a day at one plant and nine cars at another. Both these plants formerly took much more. Another mill claims that it's stocks are large so that additional buying is unnecessary.

Cleveland

Scrap is reported coming out more freely here, particularly No. 2 grade. Shipments are shut off at one of the principal mills except for a couple of cars a day which manage to slip in. There has not been any new mill buying up to the start of this week and published prices are unchanged and nominal.

Buffalo

With the area's three steel mills operating at capacity and scrap prices apparently leveled off, dealers are awaiting further mill buying with some feeling of uncertainty. Mills are fairly well supplied and in some instances have increased use of pig iron to conserve scrap. Shop turnings and borings are up 50c. on the basis of small sales.

St. Louis

Prices in St. Louis generally are unchanged. The market is quiet and the only buying is by dealers covering their short orders. Offerings from the country are freer.

Birmingham

Following elimination of exports to Japan, a few inquiries are coming into the district from export dealers relative to shipments to domestic consumers. The market undertone continues strong with inflow of country scrap showing a material increase due to close of harvesting season in the southern section of the territory.

Cincinnati

Mill pressure on prices and reluctance to reach for available material brought a softer tone to the market here in the past week. Most of the usual users of steel scrap have retired from the market except for material that is offered at a price and, as a result, dealers are bidding less on available material. The entire list has been reduced 25c.

Detroit

The feeling here is definitely pessimistic this week but the feeling is without doubt a reflection of conditions existing outside Detroit, since locally there have been no changes to affect sentiment.

New York

Only effect of cessation of Japanese shipments on this market was the elimination of the 50c. premium on export material which has prevailed for some time. Buying for both domestic mills and British account is now done on the basis of $16 to $16.50. Shipments to United Kingdom have been very light in recent weeks, a situation that holds true also for finished steel. It is expected that the rate of British shipments in the future will run about 75,000 to 85,000 tons monthly, rather than at the 136,000-ton level set in August. Dismantling of World's Fair buildings is expected to supply a moderate amount of scrap. Bulk of the steel in the buildings will probably go as second hand material for reuse.

Boston

Prices are firmer and business somewhat better. Bundled skeleton for Pittsburgh district delivery is moving at $12.25 to $12.50, f.o.b., and for eastern Pennsylvania at $13 or a little less. Steel turnings are $9.18 and $9.50, f.o.b., the price depending on delivery point. Blast furnace material is $7.90, f.o.b., for Pennsylvania delivery and $8.25 for New England delivery. One New England mill is paying $17.50 a ton delivered for No. 1 steel and $16 for No. 2, or 50c. more than exporters pay. American Steel & Wire Co. intimates it will shortly be in the market for No. 1 and 2 steel. Textile and machinery cast are less active, certain large users having shifted to engine blocks. The export market now centers in one local firm. Vessel space is in small supply at the moment.

Toronto

To meet the steadily increasing demand for iron and steel scrap, many new sources are being tapped to bring out supplies. During the past week an appeal was made to the citizens of Toronto for scrap and a city-wide collection brought forth approximately 700 tons. One large Hamilton melter is reported to have purchased a ship and scow at Cleveland which will be loaded with scrap at Duluth for delivery next month. On arrival at Hamilton, the vessels will be scrapped. Recent price advances stimulated offerings and dealers state that broader advances might bring forth much greater tonnage.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$21.00 to $22.00
Railroad heavy mltng..	22.50 to 23.00
No. 2 heavy melting..	19.50 to 20.50
Railroad scrap rails...	23.00 to 23.50
Rails 2 ft. and under..	26.50 to 27.00
Comp. sheet steel.....	21.00 to 22.00
Hand bundled sheets..	20.00 to 21.00
Heavy steel axle turn.	20.75 to 21.25
Heavy steel forge turn	19.75 to 20.25
Machine shop turnings	15.50 to 16.00
Short shov. turnings..	17.00 to 17.50
Mixed bor. & turn.....	14.00 to 15.00
Cast iron borings.....	14.50 to 15.00
Cast iron carwheels...	22.50 to 23.50
Heavy breakable cast.	17.00 to 17.50
No. 1 cupola cast.....	21.50 to 22.00
RR. knuckles & coup..	27.50 to 28.50
Rail coil springs.....	27.50 to 28.50
Rail leaf springs.....	27.50 to 28.50
Rolled steel wheels....	27.50 to 28.50
Low phos. billet crops.	27.50 to 28.00
Low phos. punchings..	26.50 to 27.00
Low phos. heavy plate.	25.50 to 26.50
Railroad malleable ...	24.50 to 25.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$20.50 to $21.00
No. 2 hvy. mltng. steel.	19.50 to 20.00
Hydraulic bund., new.	20.50 to 21.00
Hydraulic bund., old...	17.50 to 18.00
Steel rails for rolling..	25.00 to 26.00
Cast iron carwheels...	22.50 to 23.00
Hvy. breakable cast..	21.00 to 21.50
No. 1 cupola cast.....	22.50 to 23.00
Mixed yard (f'd'y) cast	.... 19.50
Stove plate (steel wks.)	.... 18.00
Railroad malleable	22.50 to 24.00
Machine shop turn....	14.50 to 15.00
No. 1 blast furnace...	13.00 to 13.50
Cast borings	14.50 to 15.00
Heavy axle turnings..	19.00 to 19.50
No. 1 low phos. hvy...	25.50 to 26.00
Couplers & knuckles..	25.50 to 26.00
Rolled steel wheels....	25.50 to 26.00
Steel axles	25.00 to 25.50
Shafting	25.00 to 25.50
Spec. iron & steel pipe	18.00 to 18.50
Cast borings (chem.).	15.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy mltng. steel.....	$19.50 to $20.00
Auto. hvy. mltng. steel alloy free	18.50 to 19.00
No. 2 auto steel.....	16.25 to 16.75
Shoveling steel.....	19.50 to 20.00
Factory bundles	19.00 to 19.50
Dealers' bundles	17.50 to 18.00
No. 1 busheling	18.50 to 19.00
No. 2 busheling, old...	11.50 to 12.00
Rolled carwheels	23.25 to 23.75
Railroad tires, cut	23.00 to 23.50
Railroad leaf springs..	23.00 to 23.50
Steel coup. & knuckles.	23.00 to 23.50
Axle turnings	18.75 to 19.25
Coil springs	24.00 to 24.50
Axle turn. (elec.).....	19.75 to 20.00
Low phos. punchings,.	22.50 to 23.00
Low phos. plates 12 in. and under	22.50 to 23.00
Cast iron borings	13.25 to 13.75
Short shov. turn.	14.00 to 14.50
Machine shop turn....	13.00 to 13.50
Rerolling rails	24.00 to 24.50
Steel rails under 3 ft..	23.00 to 23.50
Steel rails under 2 ft..	23.50 to 24.00
Ang'e bars st el	22.00 to 22.50
Cast iron carwheels ...	20.00 to 20.50
Railroad malleable	23.00 to 23.50
Agric. malleable	17.50 to 18.00
	Per Net Ton
Iron car axles	24.50 to 25.00
Steel car axles	24.00 to 24.50
Locomotive tires	18.00 to 18.50
Pipes and flues	13.50 to 14.00
No. 1 machinery cast..	17.50 to 18.00
Clean auto. blocks	18.00 to 18.50
No. 1 railroad cast.....	16.50 to 17.00
No. 1 agric. cast.....	16.00 to 16.50
Stove plate	12.50 to 13.00
Grate bars	14.00 to 14.50
Brake shoes	14.25 to 14.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$21.50 to $22.00
No. 2 hvy. mltng. steel.	20.50 to 21.00
Low phos. plate	24.00 to 24.50
No. 1 busheling	20.75 to 21.25
Hydraulic bundles	21.00 to 21.50
Machine shop turn....	14.00 to 14.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$20.50 to $21.00
No. 2 hvy. mltng. steel.	19.50 to 20.00
Comp. sheet steel.....	$20.00 to $20.50
Light bund. stampings	16.50 to 17.00
Drop forge flashings...	19.25 to 19.75
Machine shop turn....	12.50 to 13.00
Short shov. turn.....	13.00 to 13.50
No. 1 busheling	19.75 to 20.25
Steel axle turnings....	20.00 to 20.50
Low phos. billet and bloom crops	25.00 to 25.50
Cast iron borings.....	14.00 to 14.50
Mixed bor. & turn.....	14.00 to 14.50
No. 2 busheling	14.00 to 14.50
No. 1 cupola cast.....	22.00 to 22.50
Railroad grate bars...	15.50 to 16.00
Stove plate	15.50 to 16.00
Rails under 3 ft.	25.50 to 26.00
Rails for rolling	25.00 to 25.50
Railroad malleable	24.50 to 25.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$20.00 to $20.50
No. 2 hvy. mltng. steel.	18.00 to 18.50
Scrap rails	21.50 to 22.00
New hvy. bundled sheets	18.00 to 18.50
Old hydraul. bundles..	16.50 to 17.00
Drop forge flashings...	18.00 to 18.50
No. 1 busheling	18.00 to 18.50
Machine shop turn....	13.50 to 14.00
Shov. turnings	14.50 to 15.00
Mixed bor. & turn.....	13.50 to 14.00
Cast iron borings.....	13.50 to 14.00
Knuckles & couplers..	24.50 to 25.00
Coil & leaf springs....	24.50 to 25.00
Rolled steel wheels....	24.50 to 25.00
No. 1 machinery cast.	20.50 to 21.00
No. 1 cupola cast.....	19.00 to 19.50
Stove plate	17.00 to 17.50
Steel rails under 3 ft...	25.50 to 26.00
Cast iron carwheels...	18.50 to 19.50
Railroad malleable ...	22.50 to 23.50
Low phos. plate.....	25.00 to 26.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$17.00 to $17.50
No. 1 hvy. melting....	16.75 to 17.25
No. 2 hvy. melting.....	16.00 to 16.50
No. 1 locomotive tires.	19.50 to 20.00
Misc. stand. sec. rails.	20.25 to 20.75
Railroad springs	21.50 to 22.00
Bundled sheets	13.00 to 13.50
Cast bor. & turn.....	10.00 to 10.50
Machine shop turn.....	10.50 to 11.00
Heavy turnings	13.00 to 13.50
Rails for rerolling.....	23.00 to 24.00
Steel car axles	23.50 to 24.00
No. 1 RR. wrought.....	14.50 to 15.00
No. 2 RR. wrought.....	17.00 to 17.50
Steel rails under 3 ft..	22.25 to 22.75
Steel angle bars	20.00 to 20.50
Cast iron carwheels...	20.00 to 20.50
No. 1 machinery cast..	19.00 to 19.50
Railroad malleable ...	19.50 to 20.00
Breakable cast	16.75 to 17.25
Stove plate	13.50 to 14.00
Grate bars	13.50 to 14.00
Brake shoes	14.00 to 14.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$16.25 to $17.75
No. 2 hvy. mltng. steel.	14.75 to 15.25
Scrap rails for m'ltng..	21.75 to 22.25
Loose sheet clippings.	11.50 to 12.00
Hyd'lic bundled sheets	15.50 to 16.00
Cast iron borings.....	7.75 to 8.25
Machine shop turn....	8.75 to 9.25
No. 1 busheling	12.25 to 12.75
No. 2 busheling	6.50 to 7.00
Rails for rolling	23.25 to 23.75
No. 1 locomotive tires.	18.50 to 19.00
Short rails	23.75 to 24.25
Cast iron carwheels..	17.75 to 18.25
No. 1 machinery cast..	20.25 to 20.75
No. 1 railroad cast....	18.75 to 19.25
Burnt cast	12.25 to 12.75
Stove plate	12.25 to 12.75
Agricul. malleable	16.75 to 17.25
Railroad malleable ...	19.75 to 20.25
Mixed hvy. cast.....	17.50 to 18.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	$18.00
No. 2 hvy. melting steel	17.00
No. 1 busheling	16.00
Scrap steel rails	17.00
Steel rails under 3 ft...	19.50
Rails for rolling.....	20.00
Long turnings	7.50
Cast iron borings	8.50
Stove plate	11.00
Steel axles	18.00
No. 1 RR wrought.....	16.00
No. 1 cast	17.00
No. 2 cast	13.00
Cast iron carwheels....	17.00
Steel carwheels	18.00

DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 heavy melting..	$16.00 to $16.50
No. 2 heavy melting..	15.00 to 15.50
Borings and turnings.	12.00 to 12.50
Machine shop turnings	12.00 to 12.50
Long turnings	9.50 to 10.00
Short shov. turnings..	12.00 to 12.50
No. 1 cast	18.50 to 19.00
Automotive cast	18.50 to 19.00
Hvy. breakable cast...	15.00 to 15.50
Stove plate	12.25 to 12.75
Hydraul. Comp. sheets	18.50 to 19.50
New busheling	16.50 to 17.50
Sheet clips	14.50 to 15.00
Flashings	16.00 to 16.50
Low phos. plate	20.00 to 21.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	$16.00 to $16.50
No. 2 hvy. mltng. steel.	15.00 to 15.50
Hvy. breakable cast...	17.00 to 17.50
No. 1 machinery cast.	18.00 to 18.50
No. 2 cast	15.50 to 16.00
Stove plate	13.00 to 13.50
Steel car axles	20.00 to 21.00
Shafting	20.00 to 20.50
No. 1 RR. wrought....	14.50 to 15.50
No. 1 wrought long....	13.00 to 13.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	20.00 to 20.50
Clean steel turnings*..	10.00 to 10.50
Cast borings*	8.50 to 9.00
No. 1 blast furnace....	8.50 to 9.00
Cast borings (chem.)..	10.00 to 11.00
Unprepared yard scrap	8.50 to 9.00
Light iron	6.50 to 7.00
Per gross ton delivered local foundries:	
No. 1 machin. cast....	$19.00 to $19.50
No. 2 cast	16.00 to 16.50

* $1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

Breakable cast	$15.25 to $15.50
Machine shop turn....	9.18 to 9.50
Mixed bor. & turn.....	7.90 to 8.25
Bun. skeleton long....	12.25 to 13.00
Shafting	19.25 to 19.50
Stove plate	12.25 to 12.50
Cast bor. chemical.....	9.50 to 9.75
Per gross ton delivered consumers' yards:	
Textile cast	$19.00 to $21.00
No. 1 machine cast....	17.00 to 20.00
Per gross ton delivered dealers' yards:	
No. 1 hvy. m'ltng. steel.	$15.25 to $15.75
No. 2 steel	14.25 to 14.50

PACIFIC COAST

Per net ton delivered to consumer:

	San Fran.	Los Ang.	Seattle
No. 1 hvy. mltng. steel	$13.50	to	$14.00
No. 2 hvy. mltng. steel	$13.00		
Bundles	12.00		

CANADA

Dealers' buying prices at these yards, per gross ton:

	Toronto	Montreal
Low phos. steel	$12.50	$12.00
No. 1 hvy. mltng. steel.	11.25	10.75
No. 2 hvy. mltng. steel.	9.75	9.25
Mixed dealers steel...	8.75	8.25
Drop forge flashings...	9.75	9.25
New loose clippings...	8.75	8.25
Busheling	6.00	5.50
Scrap pipe	7.75	7.25
Steel turnings	7.50	7.00
Cast borings	7.50	7.00
Machinery cast	20.00	19.00
Dealers' cast	19.00	18.00
Stove plate	15.00	14.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered barges	
No. 1 hvy. mltng. steel.	$16.00 to $16.50
No. 2 hvy. mltng. steel.	15.50 to 16.00
No. 2 cast	15.00 to 15.50
Stove plate	12.50 to 13.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel.	$16.50 to $17.00
No. 2 hvy. mltng. steel	15.00 to 15.00
Rail (scrap)	17.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel.....	Nominal
No. 2 hvy. mltng. steel.....	Nominal

Construction Steel

. . . STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Lettings advance to 39,050 tons from 33,070 tons last week; new projects jump to 50,000 tons; plate awards call for only 900 tons.

AWARDS

NORTH ATLANTIC STATES

8400 Tons, Farmingdale, L. I., buildings for Republic Aviation Corp., to Bethlehem Steel Co., Bethlehem, Pa.

2500 Tons, Quonset Point, R. I., assembly and repair shop for U. S. Navy, to Ingalls Iron Works Co., Birmingham.

700 Tons, Buffalo, plant addition for Spencer Lens Co., to R. S. McMannus Steel Construction Co., Buffalo.

600 Tons, New York, coal handling facilities for Consolidated Edison Co., to American Bridge Co., Pittsburgh.

560 Tons, Elizabeth, N. Y., American Type Founders building, to Belmont Iron Works, Philadelphia.

510 Tons, Berwick, Pa., American Car & Foundry Co. buildings; 355 tons to Anthracite Bridge Co., Scranton, Pa.; 155 tons to Pine Brook Iron Works, Scranton.

500 Tons, South Boston, Mass., extension to Edison Electric Illuminating Co., No. 4 station, L Street, to West End Iron Works, Cambridge, Mass.

375 Tons, Philadelphia, building addition for Edward G. Budd Mfg. Co., to Belmont Iron Works, Philadelphia, through Wark Co., Philadelphia, general contractor.

350 Tons, Dover, N. J., six powder magazines for War Department, to Bethlehem Steel Co., Bethlehem, Pa.

335 Tons, Philadelphia, storehouse for Frankford Arsenal, to Montgomery Iron & Steel Co., Philadelphia.

230 Tons, Jefferson County, Pa., bridge route 33013, to Fort Pitt Bridge Works Co., Pittsburgh.

220 Tons, Allegheny County, Pa., maintenance warehouse, to Levison Steel Co., Pittsburgh.

200 Tons, New London, Conn., diesel engine laboratory, to Jones & Laughlin Steel Corp., Pittsburgh.

185 Tons, Camden, N. J., launchway girders and columns for New York Shipbuilding Corp., to Belmont Iron Works, Philadelphia.

155 Tons, Pittsburgh, Pittsburgh Coal Co. retail yard coal bin, to Pittsburgh Industrial Engineering Co., Pittsburgh.

150 Tons, Titusville, Pa., plant addition for Universal Cyclops Steel Co., to Fort Pitt Bridge Works Co., Pittsburgh.

150 Tons, New London, Conn., submarine base building for Government, to Ingalls Iron Works Co., Birmingham.

135 Tons, Concord, N. H., State hospital building, to Lyons Iron Works, Manchester, N. H.

105 Tons, Ridgefield, N. J., addition to power house, etc., for Lowe Paper Co., to Oltmer Iron Works, Jersey City, N. J.

100 Tons, Winchester, N. H., bridge, to American Bridge Co., Pittsburgh, through Charter Oak Construction Co., Hartford, Conn., contractor.

100 Tons, Buffalo, Greyhound bus terminal, to Buffalo Structural Steel Co., through Siegfried Construction Co. of Buffalo.

THE SOUTH

4500 Tons, Dallas, Texas, plant for North American Aviation Corp., to Muskogee Iron Works, Muskogee, Okla.

2200 Tons, Martinsville, W. Va., nylon plant for E. I. du Pont de Nemours & Co., to Bethlehem Steel Co., Bethlehem, Pa.

1153 Tons, Alcoa, Tenn., melting building for Aluminum Co. of America, to Ingalls Iron Works Co., Birmingham.

525 Tons, Rutledge, Tex., trashracks for Marshall Ford Dam (Specifications 1424-D), to Stupp Brothers Bridge & Iron Co., St. Louis.

340 Tons, Glasgow, Va., Blue Ridge Co. addition, to Belmont Iron Works, Philadelphia.

130 Tons, Beckley, W. Va., Chesapeake & Potomac Telephone Co. of West Virginia, building, to L. Schreiber & Sons, Cincinnati.

CENTRAL STATES

1500 Tons, Cleveland, addition to Republic Steel Corp. strip mill, awarded to Fort Pitt Bridge Works, Cleveland.

430 Tons, St. Louis, Olive Street Skinker viaduct, to American Bridge Co., through Samuel Kraus Co. and Israel Brothers, general contractors.

380 Tons, Detroit, Chrysler Corp. boiler house for tank arsenal, to Whitehead & Kales Co., Detroit.

270 Tons, Chicago, crane runway for American Forge Co., to Midland Structural Steel Co., Cicero, Ill.

250 Tons, Ottawa, Ill., building for Ottawa Silica Co., to Midland Structural Steel Co., Cicero, Ill.

230 Tons, Scott County, Ill., bridge section 19F, to Illinois Steel Bridge Co., Jacksonville, Ill.

190 Tons, Chicago, Charles Bruning plant, to Joseph T. Ryerson & Son, Inc., Chicago.

175 Tons, Hinckley, Minn., bridge No. 5781, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

150 Tons, Cincinatti, mirror plant for Government, to Indiana Bridge Co., Muncie, Ind.

150 Tons, Wichita, Kan., storage building and addition for Stearman Aircraft Corp. to George C. Christopher & Son, Wichita.

150 Tons, Chicago, Bernard Elementary School, to Wendnagel & Co., Chicago.

120 Tons, Wyandot County, Ohio, bridge, to Burger Iron Co., Akron, Ohio.

120 Tons, E. St. Louis, Ill., unloading platform for Continental Grain Co., to Mississippi Valley Structural Steel Co., St. Louis.

110 Tons, Beloit, Wis., brass foundry building for Fairbanks, Morse & Co., to Milwaukee Bridge Co., Milwaukee.

104 Tons, Madison and Pickaway Counties, Pitt Bridge Works Co., Pittsburgh.

WESTERN STATES

2600 Tons, Anaconda and Butte, Mont., converter plants for Anaconda Copper Mining Co., to Minneapolis-Moline Power Implement Co., Minneapolis.

2500 Tons, Vancouver, Wash., buildings for Aluminum Co. of America, to Bethlehem Steel Co., Seattle, Wash.

2000 Tons, Hawthorne, Nev., Naval Ammunition Depot buildings, to Bethlehem Steel Co., Los Angeles, through William P. Neil, Los Angeles, contractor.

900 Tons, Oakland, Cal., Navy storehouses (Specifications 10,034), to Judson-Pacific Co., San Francisco, through Monson Brothers, San Francisco, contractors.

750 Tons, Bonneville, Ore., Bonneville power house foundations, units 7 to 10, to Schmitt Steel Co., Portland, Ore., through Puget Construction Co., Seattle, contractor.

220 Tons, Salt Lake City, Utah, Air Corps hangar for Government, to Paxton & Vierling Co., Omaha.

175 Tons, Kettle Falls, Wash., bridges for Bureau of Reclamation (Specification 1421D), to Paxton & Vierling Iron Works, Omaha, Neb.

142 Tons, Startup, Wash., Wallace River bridge on State highway 15, to Pacific Car & Foundry Co., Seattle, through David Nygren, Seattle, contractor.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

7000 Tons, Cheektowaga, N. Y., airplane plant for Curtiss Aeroplane Division, Curtiss-Wright Corp.; bids taken Oct. 22.

700 Tons, Hagerstown, Md., manufacturing building for Fairchild Engineering & Aircraft Corp.

675 Tons, Elmira, N. Y., power house for Bendix Aviation Corp.

600 Tons, Baltimore, factory building for Bendix Radio Division, General Motors Corp.

500 Tons, Carteret, N. J., foundry building for Foster-Wheeler Corp.

400 Tons, Jersey City, N. J., factory building for Wallace Laboratories.

375 Tons, New Haven, Conn., building for High Standard Mfg. Co.

260 Tons, York, Pa., building for McCrory stores.

253 Tons, Allegheny County, Pa., highway bridge, route 228.

220 Tons, Quonset Point, R. I., mess hall and bakery for U. S. Navy.

200 Tons, Woodford, Vt., bridge; Ryan Densmore, Claremont, N. H., contractor.

170 Tons, Worcester, Mass., extension to abrasive grain storage building for Norton Co.

165 Tons, Quonset Point, R. I., dispensary building for U. S. Navy.

150 Tons, Corfu, N. Y., highway bridge; Mohawk Paving Co., Buffalo, low bidder.

115 Tons, West Hartford, Conn., building for Mary Immaculate Convent.

110 Tons, Pittsfield, Mass., gallery, building No. 1 General Electric Co.

100 Tons, Fenango County, Pa., highway bridge.

THE SOUTH

400 Tons, Institute, W. Va., health center for West Virginia State College.

CENTRAL STATES

12,000 Tons, Lockland, Ohio, assembly and machine shop for Wright Aeronautical Corp.

8000 Tons, Columbus, Ohio, factory and office building for Curtiss-Wright Corp.

6500 Tons, Robertson, Mo., factory and office building for Curtiss-Wright Corp.

Weekly Bookings of Construction Steel

Week Ended ——→	Oct. 22, 1940	Oct. 15, 1940	Sept. 24, 1940	Oct. 24, 1939	Year to Date 1940	Year to Date 1939
Fabricated structural steel awards	39,050	33,071	42,030	21,800	913,885	774,725
Fabricated plate awards	900	1,995	4,545	160	123,570	124,745
Steel sheet piling awards	2,735	0	2,170	110	63,570	69,825
Reinforcing bar awards	14,100	9,865	6,520	5,155	388,360	381,875
Total Letting of Construction Steel	56,785	44,931	55,265	27,225	1,489,385	1,351,175

3500 Tons, Jefferson Barracks, St. Louis County, Mo., Mississippi River bridge; bids Oct. 28.

3400 Tons, Wilmington, Ill., T.N.T. plant, E. I. du Pont de Nemours & Co., Inc.; bids Oct. 25.

1700 Tons, Wichita, Kan., three aircraft manufacturing buildings, Stearman Division of Boeing Aircraft Co.; bids taken by Austin Co., general contractor.

400 Tons, Columbus, Ohio, hangar for Air Corps.

330 Tons, Dayton, Ohio, north addition to administration building, Wright Field, for Government.

240 Tons, Decatur, Ill., store building for Sears-Roebuck & Co.

120 Tons, Battle Creek, Mich., trestle for U. S. Army.

WESTERN STATES

300 Tons, Salinas, Cal., Army hangar and buildings; W. W. Petley, Los Angeles, contractor.

300 Tons, San Diego, Cal., boiler house, San Diego, Consolidated Gas & Electric Co.; bids Oct. 24.

140 Tons, Nacimiento, Cal., renewal, Salinas River bridge for Southern Pacific Co.

130 Tons, Ogden, Utah, Air Corps reclamation building, Hill Field.

CANAL ZONE

3500 Tons, Howard Field, four Army hangars Invitation CQM-6708-41-22); bids Nov. 1.

HAWAII

550 Tons, Hickam Field, engine repair shop; Walker & Moody, Honolulu, contractor.

FABRICATED PLATES

AWARDS

900 Tons, Oleum, Calif., oil tanks, to Western Pipe & Steel Co., San Francisco.

PENDING PROJECTS

900 Tons, Bellingham, Wash., pipe for Puget Sound Pulp & Timber Co., plant.

SHEET PILING

AWARDS

2500 Tons, Puget Sound Navy Yard, to Bethlehem Steel Co., Bethlehem, Pa., through Austin Co.

135 Tons, Barberton, Ohio, expansion for Columbia Chemical Co., to Weirton Steel Co., Weirton, W. Va.

100 Tons, Milwaukee, Miller Brothers Iron & Metal Co., to Bethlehem Steel Co., Bethlehem, Pa.

PROJECTS PENDING

1500 Tons, Long Branch, N. J., sheet piling for shore protection; bids Nov. 4 at Department of Commerce, Bureau of Navigation.

Reinforcing Steel

Awards of 14,100 tons; 5,825 tons in new projects

AWARDS
ATLANTIC STATES

1200 Tons, Hartford-East Hartford, Conn., bridge, to Truscon Steel Co., Boston.

750 Tons, Lawrence, Mass., housing project, to Concrete Steel Co., Boston, through Thomas O'Connor & Co., Cambridge, Mass., contractors.

620 Tons, Schoharie County, N. Y., mesh for project FARC 40, to Truscon Steel Co., Youngstown, through Arute Bros.

500 Tons, Falmouth, Mass., Camp Edwards barracks, to Concrete Steel Co., Boston, and Joseph T. Ryerson & Son, Inc., Cambridge, Mass., jointly.

388 Tons, Huntingdon County, Pa., State highway project R-55, section 6, to Bethlehem Steel Co., Bethlehem, Pa., through L. M. Hutchinson, contractor.

300 Tons, Boston, Navy Yard docks, to Concrete Steel Co., Boston, through New England Foundation Co., Boston, contractor.

225 Tons, Philadelphia, addition to Schmidt's breweries; A. Raymond Raff, Philadelphia, general contractor.

100 Tons, Philadelphia, Marine Corps Department and Naval aircraft factory, to Truscon Steel Co., Youngstown, through M. & L. Construction Co.

100 Tons, Philadelphia, Frankford Arsenal building No. 58, to Truscon Steel Co., Youngstown, through Henry W. Horst Co.

SOUTH AND CENTRAL

700 Tons, Harford County, Va., Edgewood arsenal buildings, to Bethlehem Steel Co., Bethlehem, Pa., through Cummins Construction Co.

600 Tons, Dayton, Ohio, machine gun factory, Frigidaire division, General Motors Corp., to Bethlehem Steel Co., Bethlehem, Pa.

500 Tons, Flint, Mich., Chevrolet Motor service building, to Bethlehem Steel Co., Bethlehem, Pa., through A. A. Albrecht Co., contractor.

350 Tons, Cairo, Ill., post office, to Calumet Steel Co., Chicago, through Henke Construction Co., Chicago, general contractor.

200 Tons, LaCrosse, Wis., Viterbro College, to Bethlehem Steel Co., Bethlehem, Pa.

175 Tons, Oshkosh, Wis., Coca Cola building, to Bethlehem Steel Co., Bethlehem, Pa.

150 Tons, Minneapolis, Minn., Red Owl store building, to Bethlehem Steel Co., Bethlehem, Pa.

150 Tons, Huron County, Ohio, mash for State project No. 262, to Bethlehem Steel Co., Bethlehem, Pa., through A. J. Baltes, Norwalk, Ohio.

150 Tons, Atlanta, Ga., mesh for Atlanta Concrete Pipe Co., to Truscon Steel Co., Youngstown.

107 Tons, Front Royal, Va., State highway project to Jones & Laughlin Steel Corp., Pittsburgh, through George F. Hazelwood, Cumberland, Md.

105 Tons, Caro, Mich., Cass River bridge, to Taylor Gaskin, Inc., Detroit, through A. T. Barnes, contractor.

WESTERN STATES

4000 Tons, Alameda, Cal., Naval Air Station, to Bethlehem Steel Co., San Francisco.

1100 Tons, Vallejo, Cal., housing project, to Columbia Steel Co., San Francisco, through Barrett & Hilp, San Francisco, contractors.

500 Tons, Oakland, Cal., two storehouses, fleet supply base (Specifications 10,034), to Gunn-Carle & Co., San Francisco, through Monson Brothers, San Francisco, contractors.

240 Tons, Southgate, Cal., administration building for Southgate Junior High School, to Truscon Steel Co., Youngstown, through E. C. Nesser Co.

200 Tons, San Diego, Cal., Marine Corps base buildings, to Soule Steel Co., Los Angeles, through Los Angeles Contracting Co. and O. W. Karn, contractors.

150 Tons, Beverly Hills, Cal., Lyon Van & Storage Co. warehouse, to Soule Steel Co., Los Angeles, through P. J. Walker Co., Los Angeles, contractor.

114 Tons, Glacier Park, Mont., Two Medicine River bridge, to Bethlehem Steel Co., through W. P. Roscoe, Billings, Mont., contractor.

CANAL ZONE

400 Tons, Coco Solo, Canal Zone, aviation facilities, to Bethlehem Steel Co., Bethlehem, Pa.

REINFORCING BAR PROJECTS

ATLANTIC STATES

500 Tons, Hartford, Conn., Bellevue Square housing.

350 Tons, Washington, Naval Reserve buildings; Chas. Tompkins Co., contractor.

130 Tons, West Haven, Conn., Quinnipiac housing project.

SOUTH AND CENTRAL

710 Tons, Cincinnati, new Federal housing project; J. & E. Warm Co., general contractor.

400 Tons St. Louis, Lindberg Boulevard bridge.

300 Tons, Roanoke, Va., N. & W. Railway yard improvements.

250 Tons, Putmanville, Ind., bridges, R-2015-34; R. McCalman, contractor.

200 Tons, Charles Town, W. Va., post office; T. G. Eagen Engineering Co., low bidder.

200 Tons, Chicago, Illinois Bell Telephone Co. building.

150 Tons, Cleveland, Westinghouse Electric & Mfg. Co. light fixture plant; Austin Co., contractor.

WESTERN STATES

785 Tons, Oakland, Cal., Peralta Villa housing project; Monson Brothers, San Francisco, low bidders on general contract.

338 Tons, Oakland, Cal., administration building, cafeteria, and heating plant at Naval Supply Base (Specifications 9973); James I. Barnes, Santa Monica, Cal., low bidder on general contract.

105 Tons, Davenport, Cal., State highway work; bids Nov. 6.

CANAL ZONE

1400 Tons, Panama Canal, schedule No. 4450; bids Oct. 29.

Pipe Lines

Sinclair Pipe Line Department, Sinclair Refining Co., Sinco, Houston, Tex., plans new 6-in. cast iron pressure pipe line from Walnut Bend oil field district, southeastern part of Cook County, Tex., to Gainesville, Tex., about 28 miles, for crude oil transmission to company bulk terminal at latter place.

Morgan City, La., has authorized surveys and estimates of cost for pressure pipe line system for natural gas distribution, including main welded steel pipe line for connection with supply source, control station, meter house and other operating facilities. Proposed to arrange bond issue in required amount. T. Baker Smith, Houma, La., is consulting engineer.

Western Natural Gas Co., Inc., care of Elvis J. Stahr, 444 East 57th Street, New York, recently chartered under Delaware laws by Mr. Stahr, Jesse G. Heiges, 518 East 86th Street, New York, and George R. Brownell, Westfield, N. J., has secured permission from Federal Power Commission to construct and operate new 26-in. welded steel pipe line from gas field at Hugoton, Kan., to Milwaukee, about 770 miles, with branch lines to points in Nebraska and Missouri, for natural gas transmission. Cost estimated at $25,208,000 with booster stations, control plants at terminals and other operating facilities. Company will furnish natural gas at wholesale only to large industrial concerns and public utility interests. A new subsidiary is being organized under name of Wisconsin Natural Gas Co., to operate that part of pipe lines and facilities located in Wisconsin. Company is arranging financing through sale of stock and bonds in amount of $26,000,000. Work is scheduled to begin soon.

Cast Iron Pipe

Ware, Mass., has appropriated $10,000 for water main extensions in West Street to Palmer line and in Bacon Street.

Crandon, Wis., plans pipe lines for water system and other waterworks installation. Cost about $125,000, of which $40,000 will be secured through Federal aid. Project has been approved at special election.

Auburn, Neb., plans pipe line extensions in water system, including 10-in. main to connect new wells; also pumping stations, filter plant and other facilities. Bond issue of $34,000 has been approved for project.

Vancouver, Wash., plans pipe lines for water system in Minnehaha district and other waterworks installation. Cost about $85,900. Special election has been called Nov. 9 to approve bond issue of $48,000, additional fund to be secured through other financing. J. L. Henderson, City Hall, is city engineer.

Williams, Ariz., plans pipe line extensions and improvements in system, including new main line from municipal reservoir to connection with distribution system on Hancock Avenue; also filter plant equipment and other waterworks installation. Bond issue of $55,000 has been authorized.

Board of District Commissioners, Washington, has low bid at $68,282 for main pipe line from pumping station at Anacostia to elevated tank at Alabama Avenue and Naylor Road, S. E., from W. F. Brenizer Co., 1501 South Capitol Street.

Board of South Fayette Township Commissioners, Cuddy, Pa., plans about 16 miles of 5-in. centrifugally cast, cement-lined pipe for extensions in township pipe line system. Cost about $150,000. Bond issue in that amount will be placed before voters at general election, Nov. 5. Municipal Engineering Co., 2020 West Liberty Avenue, Pittsburgh, is consulting engineer.

Jackson County Public Water Supply District No. 8, Blue Springs, Mo., care of Henrici-Lowry Engineering Co., 114 West Tenth Street, Kansas City, Mo., consulting engineer, has called special election Nov. 20 to approve bonds for $91,000 for pipe lines for water system, to cover area of about 20 sq. miles near Blue Springs. Additional financing is planned through Federal aid.

Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point → / ↓ Product	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes[2]	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢		
TIN PLATE Standard cokes (Per 100-lb base box)	$5.00	$5.00	$5.00						$5.10						
BLACK PLATE 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			
TERNES, M'FG. Special coated (Per base box)	$4.30		$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢					2.40¢	2.70¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢		
Reinforcing (rail)[7]	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.40¢	2.45¢	2.15¢		
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							2.70¢		
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Coatesville and Claymont = 2.10¢)		2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)										
SHAPES Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Spring	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)								
PILING Steel sheet	2.40¢	2.40¢				2.40¢					2.85¢	2.95¢			
IRON BARS Common		2.25¢			(Terre Haute, Ind. = 2.15¢)										
Refined	3.75¢														
Wrought	4.40¢														

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to 29 gage within certain width and length limitations. [6] For merchant trade. [7] Straight lengths as quoted by distributers. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lots to manufacturing trade. [10] Boxed.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher f.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the forging of shells and includes rounds, round squares, and special sections.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)	*Per Lb.*
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 4/64 in., $3 a net ton higher. Quantity extras apply.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cut nails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	56
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. and smaller by 6 in. and shorter	68
9/16 and ⅝ in. by 6 in. and shorter	66
¾ to 1 in. by 6 in. and shorter	64
1⅛ in. and larger, all lengths	62
All diameters over 6 in. long	62
Lag, all sizes	65
Plow bolts	68½
Hot pressed nuts; c.p.c., t-nuts; square, hex., blank or tapped:	
½ in. and smaller	66
9/16 in. to 1 in. inclusive	63
1⅛ in. to 1½ inclusive	61
1⅝ in. and larger	60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts	U.S.S.	S.A.E.
½ in. and smaller	66	70
9/16 to 1 in.	63	65
1⅛ in. through 1½ in.	61	62
1⅝ in. and larger	60	..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	72½ and 10
Stove bolts in packages, with nuts attached	72½
Stove bolts in bulk	82

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.40

Small Rivets

(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 10

Cap and Set Screws

	Per Cent Off List
Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread ¼ in. and larger	64
3/16 in. and smaller	73
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	70
Upset set screws, cup and oval points	75
Milled studs	52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Oct. 16	Oct. 17	Oct. 18	Oct. 19	Oct. 21	Oct. 22
Copper, Electrolytic[1]	12.00	12.00	12.00	12.00	12.00	12.00
Copper Lake	12.00	12.00	12.00	12.00	12.00	12.00
Tin, Straits, New York	51.625	51.625	51.625	....	51.625	51.625
Zinc, East St. Louis[2]	7.25	7.25	7.25	7.25	7.25	7.25
Lead, St. Louis[3]	5.35	5.35	5.35	5.35	5.35	5.35

[1] Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Products

Cents per lb., Delivered

	New York	Cleveland
Tin		
Straits pig	52.75	54.50
Copper		
Electro	12.75	14.00
Castings	12.50	13.50
H. R. Sheets*	20.12	20.12
Seamless tubes*	20.62	20.62
Brass		
Yellow, sheets*	18.65	18.65
Yellow, rods*	13.67	13.67
Seamless tubes*	21.40	21.40
Zinc		
Slabs	8.50	8.10
Sheets, No. 9 casks	12.50	14.00
Lead		
American pig	6.50	6.00
Bar	8.20	8.75
Cut sheets	8.50	8.75
Antimony		
Asiatic	16.00	17.00
Aluminum		
Virgin, 99%	20.00	21.00
No. 1 remelt., 98-99%	18.00	18.50
Solder		
½ and ½	31.50	32.25
Babbitt		
Anti-friction grade	23.50	21.75

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible	9.25	9.875
Hvy. and wire	8.25	8.650
Light and bottoms	7.25	7.750
Brass		
Heavy	5.50	6.005
Light	4.50	5 250
No. 1 yel. turn.	5.25	6.25
No. 1 red or compo. turnings	8.50	9.00
Hvy. Mach. compo.	8.875	9.250
Lead		
Heavy	4.50	5.00
Aluminum		
Cast	9.00	10.00
Sheet	13.50	14.50
Zinc	4.375	5.125

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 18c.-19c. a lb.; No. 12 remelt No. 2 standard, 18c.-19c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICKSILVER, $169-$172 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33⅓; on brass sheets and rods, 40; on brass tubes, 33⅓, and copper tubes, 40.

ALLOY STEEL

Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem.....$54.00

Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade ..... 2.70c.
Delivered, Detroit ..... 2.80c.

S.A.E. Series Numbers	Alloy Differential, per 100 Lb.
2000 (1.5 Ni)	$0.35
2100 (1.5 Ni)	0.75
2300 (3.5 Ni)	1.70
2500 (5 Ni)	2.55
3100 Ni-Cr	0.70
3200 Ni-Cr	1.35
3300 Ni-Cr	3.80
3400 Ni-Cr	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.)	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.)	0.75
x4340 Cr-Ni-Mo	1.70
4340 Cr-Ni-Mo	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.20
5100 (0.60-0.90 Cr)	0.35
5100 (0.80-1.10 Cr)	0.45
5100 Cr spring steel	0.15
52-100 Cr. (electric furnace)	2.60
6100 Cr-V bar	1.20
6100 Cr-V spring steel	0.85
C-V	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c., carlots.

Alloy Steel Plates

Base per lb., f.o.b. Pittsburgh, Chicago and Coatesville.

Open hearth grade.....3.50c.

Your Electric Hoists Should Be "Shaw-Box"!

...They Cost Less To Operate

7 Reasons Why

Only in Shaw-Box Hoists can you get these features that make them the most economical hoists to use, and for the work they do the least expensive to buy.

1 — "One-Point" Lubrication System
2 — Interchangeable Suspension
3 — "Fool Proof" Upper Stop
4 — Two-Gear Reduction Drive
5 — "Hyatt" Roller Bearings
6 — Totally Enclosed Construction
7 — Ball Bearing Motors

Shaw-Box Electric Hoists are doing the lifting in thousands of plants across the country, in all industries — lifting jobs like yours . . . Always they have speeded production, taken the burden from men, lowered costs and increased profits.

In the Shaw-Box line of Electric Hoists you will find the one you seek for your own necessities . . . Sizes range from 250 pounds to 20 tons lifting capacity in combinations and arrangements to meet every requirement of industry . . . Back of them are the hoisting experiences of operating men in thousands of plants in all industries, and, the experience of more than half a century devoted to the development and manufacture of cranes and hoists exclusively.

Send for catalog that contains complete information and many illustrations of profit making installations that may suggest an application to you.

Makers of all types and sizes of Electric and Hand Operated Cranes, and Electric Hoists, including the famous Portable Electric "Budgit" Hoists . . . ***Send all your inquiries for cranes and hoists to "Shaw-Box"!***

SHAW BOX CRANE & HOIST DIVISION
MANNING, MAXWELL & MOORE, INC.
402 Broadway MUSKEGON, MICHIGAN

STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chromium-Nickel

No.	304	302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium

No.	410	430	442	446
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
H't strip	17.00c.	17.50c.	24.00c.	35.00c.
C'ld st.	22.00c.	22.50c.	32.00c.	52.00c.

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed	67c.
High-carbon-chromium	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless Cold Dawn	Seamless Hot Rolled	Lap Weld, Hot Rolled
1 in. o.d. 13 B.W.G.	$9.01	$7.82	....
1¼ in. o.d. 13 B.W.G.	10.67	9.26	....
1½ in. o.d. 13 B.W.G.	11.70	10.23	$9.72
1¾ in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d. 13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d. 12 B.W.G.	18.45	16.01	15.16
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d. 12 B.W.G.	21.42	18.59	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4½ in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extas for less carload quantities:

40,000 lb. or ft. over ..... Base
30,000 lb. or ft. to 39,999 lb. or ft. 5%
20,000 lb. or ft. to 29,999 lb. or ft. 10%
10,000 lb. or ft. to 19,999 lb. or ft. 20%
5,000 lb. or ft. to 9,999 lb. or ft. 30%
2,000 lb. or ft. to 4,999 lb. or ft. 45%
Under 2,000 lb. or ft. 65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron pipe)

Base Price=$200 Per Net Ton

Butt Weld

Steel	Black	Galv.
⅛ in.	56	36
¼ to ⅜ in.	59	43½
½ in.	63½	54
¾ in.	66½	58
1 to 3 in.	68½	60½

Wrought Iron	Black	Galv.
¼ and ⅜ in.	+9	+10
½ in.	24	6½
¾ in.	30	13
1 and 1¼ in.	34	19
1½ in.	38	21½
2 in.	37½	21

Lap Weld

Steel		
2 in.	61	52½
2½ and 3 in.	64	55½
3½ to 6 in.	66	57¼
7 and 8 in.	65	55½
9 and 10 in.	64½	55
11 and 12 in.	63½	54

Wrought Iron		
2 in.	30½	15
2½ to 3½ in.	31½	17½
4 in.	33½	21
4½ to 8 in.	32½	20
9 to 12 in.	28½	15

Butt weld, extra strong, plain ends

Steel	Black	Galv.
⅛ in.	54½	41½
¼ to ⅜ in.	56½	45½
½ in.	61½	53½
¾ in.	65½	57½
1 to 3 in.	67	60

Wrought Iron		
¼ and ⅜ in.	+10	+43
½ in.	25	9
¾ in.	31	15
1 to 2 in.	38	22½

Lap weld, extra strong, plain ends

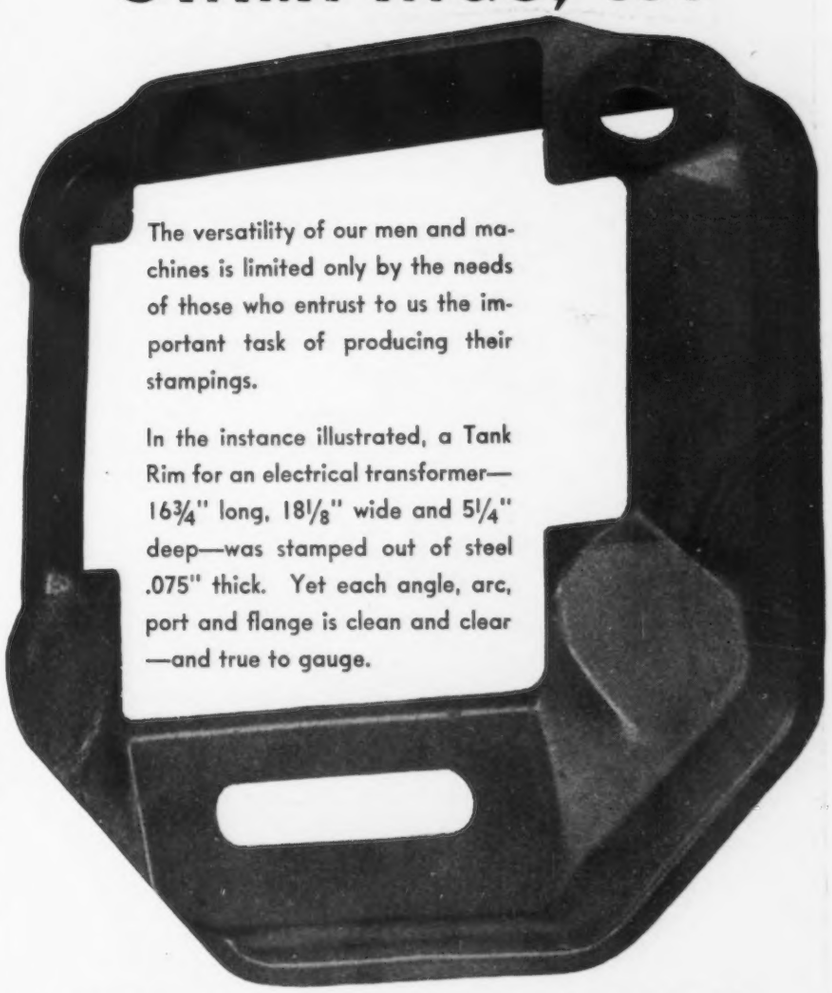
Steel		
2 in.	59	51½
2½ and 3 in.	63	55½
3½ to 6 in.	66½	59
7 and 8 in.	65½	56
9 and 10 in.	64½	55
11 and 12 in.	63½	54

Wrought Iron		
2 in.	33½	18½
2½ to 4 in.	39	25½
4½ to 6 in.	37½	24
7 and 8 in.	38½	24½
9 to 12 in.	32	20½

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

LIGHTER GAUGE STAMPINGS, too



The versatility of our men and machines is limited only by the needs of those who entrust to us the important task of producing their stampings.

In the instance illustrated, a Tank Rim for an electrical transformer—16¾" long, 18⅛" wide and 5¼" deep—was stamped out of steel .075" thick. Yet each angle, arc, port and flange is clean and clear—and true to gauge.

Present your problems to Parish. The services of our engineers frequently result in economies of important proportions . . . yet their contributions are not evident in our costs.

Let us review your requirements.

PARISH PRESSED STEEL CO.
READING, PA.
PACIFIC COAST REPRESENTATIVE, F. Somers Peterson Co., 57 California St., San Francisco, Cal.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

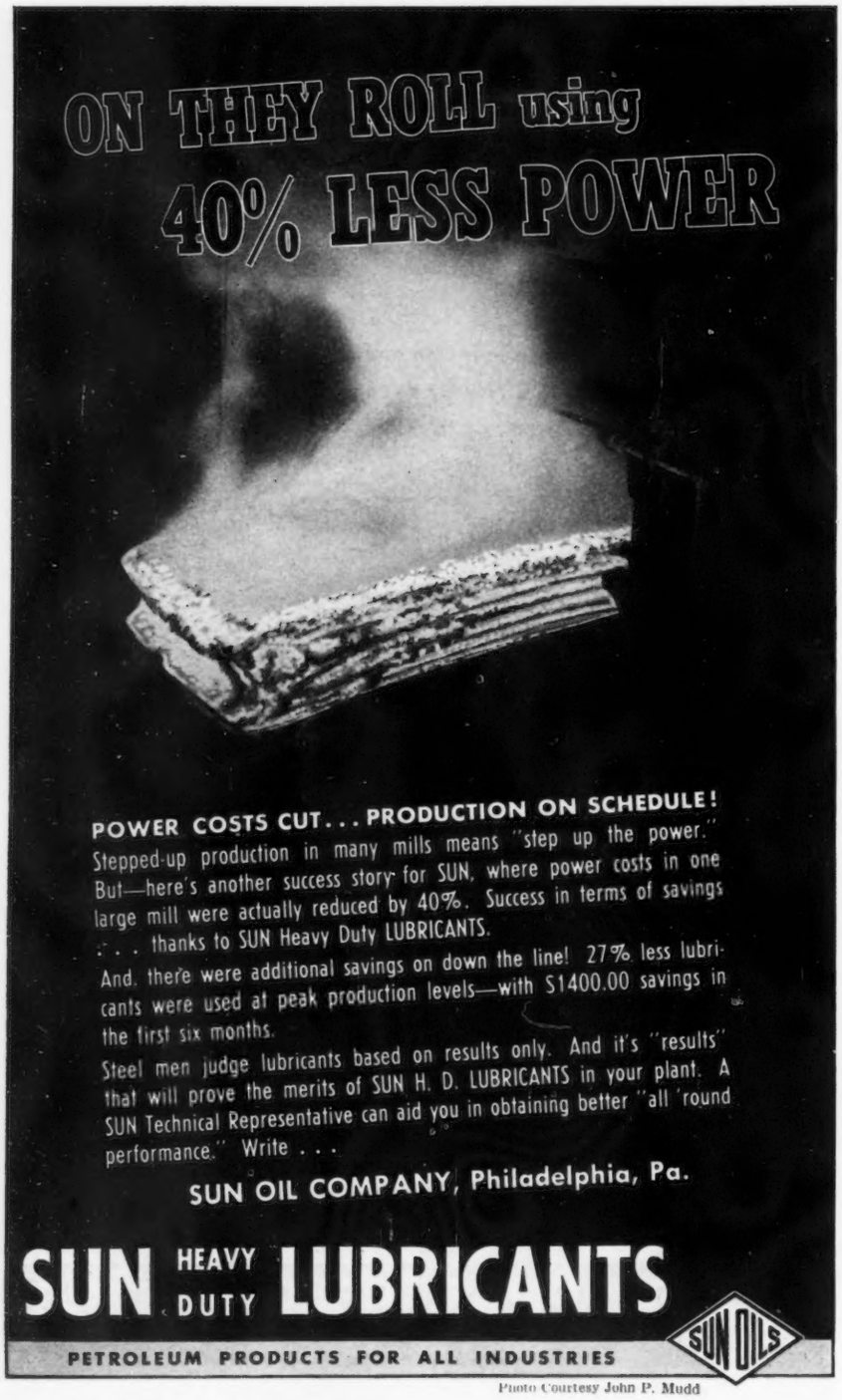
	Per Gross Ton
Old range, bassemer, 51.50%..	$4.75
Old range, non-bessemer,51.50%	4.60
Mesaba, bessemer, 51.50%....	4.60
Mesaba, non-bessemer, 51.50%.	4.45
High phosphorus, 51.50%.....	4.35

Foreign Ores*

C.i.f. Philadelphia or Baltimore, Exclusive of Duty

	Per Unit
Algerian, low P, Cu free, dry, 55 to 58% Fe	12c.
Caucasian, washed, 52% Mn	60c.
African, Indian, 44 to 48% Mn..	51c.
African, Indian, 49 to 51% Mn..	56c.
Brazilian, 46 to 48% Mn	53c.
Cuban, del'd, duty free, 51% Mn.	72c.

	Per Short Ton Unit
Tungsten, Chinese, Wolframite, duty paid, delivered	Nom.
Tungsten, domestic scheelite, delivered	Nom.
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	Nom.
Rhodesian, 45%	$23.50
Rhodesian, 48%	27.50


ON THEY ROLL using
40% LESS POWER
POWER COSTS CUT... PRODUCTION ON SCHEDULE!
Stepped-up production in many mills means "step up the power." But—here's another success story for SUN, where power costs in one large mill were actually reduced by 40%. Success in terms of savings . . . thanks to SUN Heavy Duty LUBRICANTS.
And, there were additional savings on down the line! 27% less lubricants were used at peak production levels—with $1400.00 savings in the first six months.
Steel men judge lubricants based on results only. And it's "results" that will prove the merits of SUN H. D. LUBRICANTS in your plant. A SUN Technical Representative can aid you in obtaining better "all 'round performance." Write . . .
SUN OIL COMPANY, Philadelphia, Pa.
SUN HEAVY DUTY LUBRICANTS
PETROLEUM PRODUCTS FOR ALL INDUSTRIES
SUN OILS
Photo Courtesy John P. Mudd

RAILS, TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., gross ton	$40.00
Angle bars, 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets), gross ton	$40.00
Light rails (from rail steel), gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts, steam railroads	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts)	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneaqua, Colo., Birmingham and Pacific Coast ports: tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR *Per Net Ton*

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail	$19.00
Domestic, f.o.b. Ohio River landing barges	19.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines	19.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid	Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.00
As above, in bags, f.o.b. same mines	32.60

REFRACTORIES

Fire Clay Brick	*Per 1000 f.o.b. Works*
Super-duty brick, at St. Louis	$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1 Ohio	39.90
Ground fire clay, per ton	7.10
Silica Brick	
Pennsylvania	$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement, net ton (Eastern)	8.55
Chrome Brick	*Net per Ton*
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$50.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	50.00
Magnesite Brick	
Standard f.o.b. Baltimore and Chester	$72.00
Chemically Bonded, f.o.b. Baltimore	61.00
Grain Magnesite	
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	(—)*
Domestic, f.o.b. Baltimore and Chester in sacks	$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

*None available.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $120.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% $36.00
Domestic, 26 to 28% 49.50

Electric Ferrosilicon

Per Gross Ton, Delivered, Lump Size

50% (carload lots, bulk) $74.50*
50% (ton lots, packed) 87.00*
75% (carload lots, bulk) 135.00*
75% (ton lots, packed) 151.00*

Bessemer Ferrosilicon

Per Gross Ton, F.o.b. Jackson, Ohio

10.00 to 10.50% $33.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2% $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton, F.o.b. Jackson, Ohio

5.00 to 5.50% $27.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots Lump Size, on Contract

4 to 6% carbon ..... 11.00c.
2% carbon ..... 17.50c.
1% carbon ..... 18.50c.
0.10% carbon ..... 20.50c.
0.06% carbon ..... 21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon $113.00*
2.50% carbon 118.00*
2% carbon 123.00*
1% carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload $2.00
Ferrotungsten, 100 lb. and less 2.25
Ferrovanadium, contract, per lb. contained V., del'd $2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots ..... $2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton $142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton $157.50
Ferrophosphorus, electric or blast furnace material, in carloads, fo.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton 58.50
Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross tons, $3 unitage, freight equalized with Nashville 75.00
Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace ..... 80c.
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J. ..... 4.10c.
No. 6, f.o.b. Bayonne, N. J. ..... 2.98c.
No. 5 Bur. Stds., del'd Chicago 3.25c.
No. 6 Bur. Stds., del'd Chicago 2.75c.
No. 3 distillate, del'd Cleveland 5.25c.
No. 4 industrial, del'd Cleveland 5.00c.
No. 5 industrial, del'd Cleveland 4.00c.
No. 6 industrial, del'd Cleveland 3.50c.

Actual Case Stories About How Users Benefit from FORGINGS

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FORGINGS PROVIDE MAXIMUM DURABILITY IN SOUTH BEND LATHES . . . CONTRIBUTE TO THEIR ATTRACTIVE APPEARANCE
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Over 300 applications of forgings have been described in "Drop Forging Topics." It is published for engineers, metallurgists, designers, production and management executives. If you belong to one of these classifications and are not now receiving "Drop Forging Topics," write us and you will receive it regularly—FREE!

THERE ARE NO SUBSTITUTES FOR FORGINGS

DROP FORGING ASSOCIATION
605 HANNA BUILDING • CLEVELAND, OHIO

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt ..... $4.50 to $4.75

Foundry, f.o.b. Connellsville, prompt ..... $5.25 to 5.50

F'dry, by-product, Chicago 10.50

F'dry, by-product, New England 13.00

Foundry, by-product, Newark or Jersey City ..... $11.30 to $11.90

F'dry, by-product, Philadelphia 11.13

F'dry, by-product, Cleveland ... 11.55

F'dry, by-product, Cincinnati ... 11.00

Foundry, Birmingham 7.50

F'dry, by-product, St. Louis $10.75 to $11.00

Foundry, from Birmingham, f.o.b. cars dock Pacific ports $14.75

BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export £17 18s.

Tin plate, per base box. 32s. to 33s.

Steel bars, open hearth £13 9s.

Beams, open hearth .... £12 2s. 6d.

Channels, open hearth .. £12 2s. 6d.

Angles, open hearth .... £12 2s. 6d.

Black sheets, No. 24, gage £18 17s. 6d. max.*; £18 17s. 6d. min.**

Galvanized sheets, No. 24 gage £19 10s. max.*; £19 10s. min.**

*Empire markets only.
**Other than Empire markets.

PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston	***$24.50***	***$24.00***	***$25.50***	***$25.00***	.....
Brooklyn	***26.50***	.....	.....	***27.00***	.....
Jersey City	***25.53***	***25.03***	***26.53***	***26.03***	.....
Philadelphia	***24.84***	***24.34***	***25.84***	***25.34***	.....
Bethlehem, Pa.	$24.00	$23.50	$25.00	$24.50	.....
Everett, Mass.	24.00	23.50	25.00	24.50	.....
Swedeland, Pa.	24.00	23.50	25.00	24.50	.....
Steelton, Pa.	.....	23.50	.....	.....	28.50
Birdsboro, Pa.	24.00	23.50	25.00	24.50	28.50
Sparrows Point, Md.	24.00	23.50	.....	.....	.....
Erie, Pa.	23.00	22.50	24.00	23.50	.....
Neville Island, Pa.	23.00	22.50	23.50	23.00	.....
Sharpsville, Pa.	23.00	22.50	23.50	23.00	.....
Buffalo	23.00	22.00	24.00	23.50	28.50
Cincinnati	***23.44***	***23.61***	.....	***24.11***	.....
Canton, Ohio	***24.39***	***23.89***	***24.89***	***24.39***	.....
Mansfield, Ohio	***24.94***	***24.44***	***25.44***	***24.94***	.....
St. Louis	***23.50***	***23.02***	.....	.....	.....
Chicago	23.00	22.50	23.50	23.00	.....
Granite City, Ill.	23.00	22.50	23.50	23.00	.....
Cleveland	23.00	22.50	23.50	23.00	.....
Hamilton, Ohio	23.00	22.50	.....	23.00	.....
Toledo	23.00	22.50	23.50	23.00	.....
Youngstown	23.00	22.50	23.50	23.00	.....
Detroit	23.00	22.50	23.50	23.00	.....
St. Paul	***25.63***	.....	***26.13***	***25.63***	.....
Duluth	23.50	.....	24.00	23.50	.....
Birmingham	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle	***27.50***	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....
Montreal†	27.50	27.50	.....	28.00	.....
Toronto†	25.50	25.50	.....	26.00	.....

GRAY FORGE

Valley or Pittsburgh fce. $22.50

CHARCOAL

Lake Superior fce. $27.00
Delivered Chicago 30.34

Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

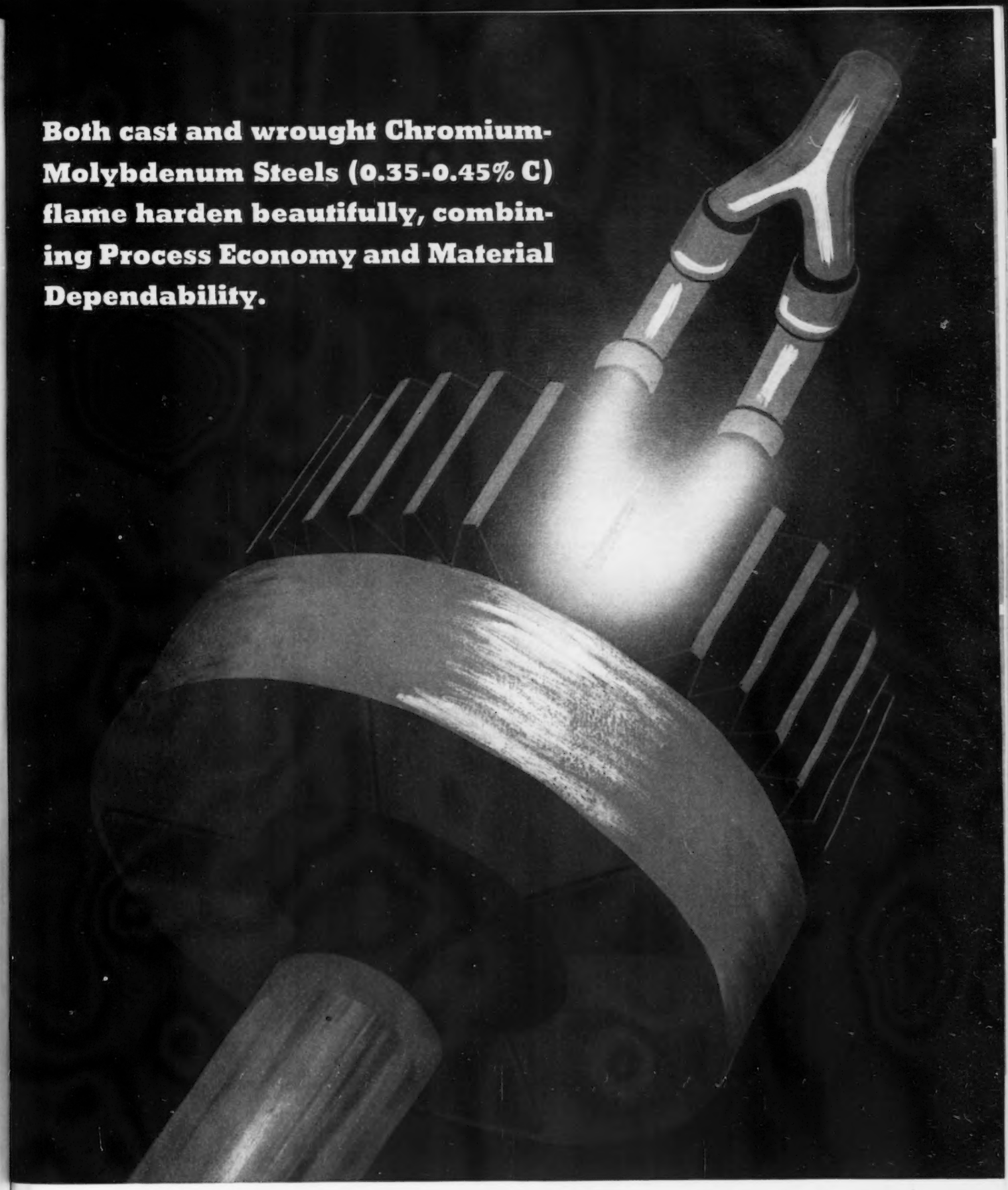
*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled	$3.15	$3.05	$3.15	$3.35	$3.38	$3.23	$3.05	$3.51	$3.45	$3.18	$3.30	$3.48	$4.30
Sheets, cold rolled	....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	....	4.12	4.35	4.43	6.50
Sheets, galvanized	4.75	4.60	4.42	4.75	4.30	4.64	4.00	4.66	4.75	4.95	4.75	4.98	5.25
Strip, hot rolled	3.40	3.40	3.30	3.75	3.76	3.48*	3.62	3.86	3.70	3.52	3.65	3.73	....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.31	3.20	3.22	3.26	....	3.41	3.83	3.54	....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.47	3.80	3.68	4.00
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.47	3.80	3.68	4.00
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.62	3.75	3.63	4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.20	7.10	7.55	7.31	7.35	7.42	7.35	7.50	....	7.47	7.45	7.33	9.40
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300	8.15	8.15	8.15	8.56	8.59	8.45	8.40	8.63	....	8.52	8.84	8.38	10.65
Bars, cd. drn. SAE 3100	6.75	6.75	6.75	7.16	7.19	7.05	6.75	7.23	....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, $3.23.


Both cast and wrought Chromium-Molybdenum Steels (0.35-0.45% C) flame harden beautifully, combining Process Economy and Material Dependability.

MOLY

Climax Mo-lyb-den-um Company
500 Fifth Avenue · New York City

Sales Possibilities

. . . CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

• **General Electric Co.**, Pittsfield, Mass., will build a $5,000,000 addition to its transformer manufacturing unit, which, when completed, will be used for the manufacture of gun detectors for the government. The $5,000,000 expansion is part of $50,000,000 the company will spend on plants at various locations.

Hartford Electric Steel Corp., 540 Flatbush Ave., Hartford, Conn., is about to start construction of a one-story, 20 x 120 ft., manufacturing plant addition. Peter Bell, 25 Abbottsford Ave., Hartford, has the contract.

Maxim Silencer Co., 85 Homestead Ave., Hartford, Conn., has taken under advisement bids on a two-story, 40 x 52 ft., manufacturing unit to be devoted to government munition work.

American Tube Bending Co., Inc., 5 Lawrence St., New Haven, Conn., has awarded a contract to Ibson Brothers, 370 Skiff Street, Hamden, Conn., for factory alterations.

Edo Aircraft Corp., College Point, L. I., N. Y., has let general contract to Brown & Matthews, Inc., 122 East 42nd Street, New York, for design and construction of two-story addition, totaling 50,000 sq. ft. floor space. Cost over $200,000 with equipment.

Rochester Ropes, Inc., 91-30 Van Wyck Boulevard, Jamaica, N. Y., has let general contract to Fred B. Fuqua, Krise Building, Lynchburg, Va., for new one-story branch plant at Culpeper, Va. Cost about $90,000 with equipment.

Constructing Quartermaster, U. S. Army, 90 Church Street, New York, asks bids until Nov. 1 for air corps operation hangar No. 1 and flight hangars Nos. 1, 2 and 3, at Howard Field, C. Z.

American Cyanamid Co., 30 Rockefeller Plaza, New York, plans two-story and basement addition to branch plant on Tremley Point Road, Linden, N. J., 45 x 95 ft., for storage and distribution. Cost about $45,000 with equipment. J. L. Dymock, 46 Forest Road, Tenafly, N. J., is engineer.

Public Works Officer, Naval Ammunition Depot, Iona Island, N. Y., plans one-story storage and distributing building, cost about $150,000 with equipment; also one-story addition to loading plant No. D, cost about $60,000, and extension in main wharf, cost about $70,000.

General Electric Co., Schenectady, N. Y., has let general contract to James Stewart & Co., Inc., 230 Park Avenue, New York, for one-story addition to local plant, 170 x 800 ft., to be equipped for production of radio transmitters and allied equipment. Cost close to $500,000 with machinery.

Flintkote Co., Inc., 50 West 50th Street, New York, has authorized expansion in new branch plant now in course of construction near Meridian, Miss., consisting of additional one-story production units, storage and distributing buildings, and other facilities. Cost close to $1,000,000 with machinery.

Celanese Corp. of America, Inc., 180 Madison Avenue, New York, has asked bids on general contract for three-story and basement addition, 100 x 400 ft., to mill at Amcelle, Cumberland, Md. Cost over $200,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 1 for quantity of steel alloy tap rivets (Schedule 3640) for Brooklyn and Philadelphia navy yards; until Oct. 29 for 2500 aluminum alloy cartridge cases (Schedule 3567) for Philadelphia and San Diego, Cal., yards; 1122 sets of Swiss files (Schedule 3563) for Philadelphia, Sewall's Point, Va., and other yards.

Camden Forge Co., Camden, N. J., plans one-story additions for production of equipment for Navy Department, including installation of new tools, furnaces and other facilities. Cost about $2,873,000 with machinery, fund to be secured through Federal department noted.

Magnetic Pigment Co., Trenton, N. J., a subsidiary of Columbian Carbon Co., 41 East 42nd Street, New York, has begun work on four-story addition, 40 x 110 ft., for which general contract recently was let to Newton A. K. Bugbee Co., Inc., 206 East Hanover Street, Trenton. Cost over $100,000 with equipment.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Oct. 28 for quantity of rotary files (Circular 938), band saws, rip saws, etc. (Circular 932); until Oct. 29 for quantity of copper wire nails, sinker nails (Circular 942).

Edward G. Budd Mfg. Co., 25th Street and Hunting Park Avenue, Philadelphia, has let general contract to Wark Co., 1700 Sansom Street, for one-story addition. Cost over $125,000 with equipment. Ballinger Co., 105 South 12th Street, is architect and engineer.

Bendix Aviation Corp., South Bend, Ind., has purchased former plant of Atwater Kent Mfg. Co., Wissahickon Avenue and Abbottsford Road, Philadelphia, comprising tract of 45 acres, with series of one-story buildings, totaling 640,000 sq. ft. of floor space. Plant will be improved and equipped at once, with facilities for about 2500 workers. Cost close to $3,000,000 including property acquisition.

Consolidated Machine Tool Corp., 565 Blossom Road, Rochester, N. Y., has let general contract to A. Friederich & Sons Co., 710 Lake Street, for three-story addition, 140 x 160 ft., with one-story extension, 30 x 80 ft. Cost over $135,000 with equipment. J. F. Ancona, 311 Alexander Street, is engineer.

Eastman Kodak Co., Kodak Park, Rochester, N. Y., plans six-story addition to Hawk Eye Camera Works for production of optical instruments and equipment for Federal Government. Cost over $500,000 with machinery. It is understood that erection will be carried out by Ridge Construction Co., Kodak Park.

Excel Metal Cabinet Co., Inc., Johnson Street, Jamestown, N. Y., plans one-story addition to plant on East James Street, Falconer, N. Y. Cost over $50,000 with equipment.

National Fireworks, Inc., 60 Washington Street, Boston, plans new shell-loading plant at Hanover, Mass. It will comprise a group of 15 one-story buildings, with machine shop, boiler plant and other mechanical units. Output will be for Federal Government. Cost close to $500,000 with equipment.

Peerless Aluminum Casting Co., Mount Grove Street, Bridgeport, Conn., Peter S. Hardy, head, plans new one-story foundry, 42 x 150 ft., on Andover Street. Cost close to $50,000 with equipment. Peter P. Petrofsky, Bridgeport, is architect.

Public Works Officer, Naval Torpedo Station, Newport, R. I., plans new one and multi-story torpedo assembling plant, to cost about $750,000 with equipment; also one-story addition to fuze and primer works, cost about $100,000 with equipment; new coal-handling equipment for power plant, $50,000; and one-story storehouse for paint and alcohol, $20,000.

New London Terminal Co., New London, Conn., has let general contract to Trimount Dredging Corp., 10 State Street, Boston, for new bulk oil storage and distributing terminal on waterfront, extending from Eastern Point Road to harbor district, New London. It will consist of 845-ft. wharf extending into Thames River, several one-story buildings, five 80,000-gal. steel tanks, boiler house, pumping station and other structures. Cost close to $250,000 with equipment. Leo F. Caproni, 1221 Chapel Street, New Haven, Conn., is architect and engineer.

Bogue Electric Co., 80 Glover Street, Paterson, N. J., has expanded its facilities and is now in a position to assure stock shipment on its line of plating generators, special alternators, synchronous motors and other equipment. Low voltage generator line has been extended to include 25,000 ampere machines at six volts and synchronous motors to 250 hp.

Lord Mfg. Co., 1635 West Twelfth Street, Erie, Pa., couplings, bonded joints and kindred products, plans one-story addition. Cost close to $60,000 with equipment.

Pennsylvania Furnace & Iron Co., Warren, Pa., steel tanks and other plate products, plans two one-story additions, 50 x 100 ft., and 50 x 60 ft., respectively. Cost over $65,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 6 for diesel-electric traveling, revolving jib drydock cranes for New York Navy Yard (Brooklyn) and naval drydock, Hunters Point, Cal.; diesel-electric and gasoline-electric traveling hammerhead cranes for New York (Brooklyn), Philadelphia and Boston navy yards (Specifications 10086); also bids (no closing date stated) for one air compressor, capacity 10,000 cu. ft. per min., with alternate bids for two compressors of 5000 cu. ft. per min. rating, including synchronous motor-drive, exciter set, switchgear, inter and after coolers, and complete auxiliary equipment for navy yard, Pearl Harbor, T. H.

E. I. du Pont de Nemours & Co., Inc., Rayon Division, du Pont Building, Wilmington, Del., plans new mill for production of nylon at Martinsville, Va., where tract of about 485 acres of land has been acquired, to comprise group of large one and multi-story units, power house, pumping station, machine shop and other mechanical departments. Completion is scheduled late in 1941. Cost over $10,000,000 with machinery.

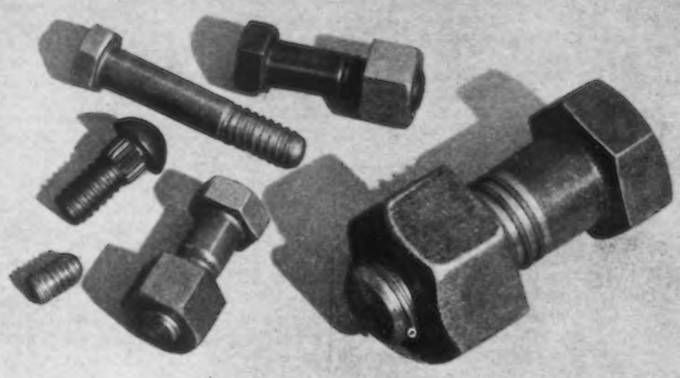
Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Oct. 29 for quantity of vacuum filter plates.

Newport News Shipbuilding & Drydock Co., Newport News, Va., plans large plant expansion, including new shipways, docks, piers, machine and metal-working shops, and other mechanical shops and buildings, including extensions in power house and yard power facilities. Development will be used for construction of vessels for Navy Department, Washington, which will provide an appropriation of $14,000,000 for project.

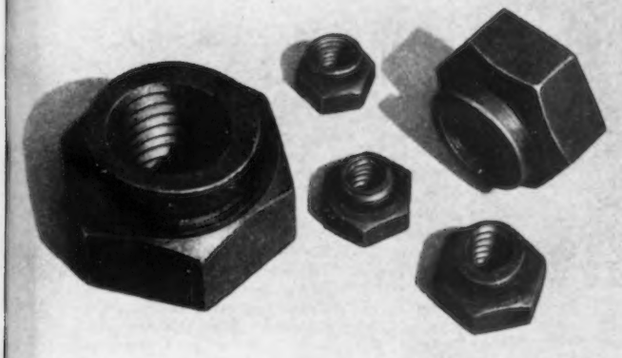
Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 29 for quantity of clamps and punches (Schedule 3526), chisels, files and hammers (Schedule 3557), hacksaw frames (Schedule 3509), motor-driven diesel fuel oil transfer pumps (Schedule 3562), motor-driven press brake machines (Schedule 3566), chisels and chisel blanks (Schedule 3583), hacksaw blades (Schedule 3587), portable pneumatic drills, grinders and hammers (Schedule 3484), sailmaker's needles (Schedule 3568), nippers and pliers (Schedule 3577), gasoline motor-driven centrifugal pumps (Schedule 3581), drill chucks (Schedule 3570), files and rasps (Schedule 3590); until Nov. 1 for quantity of aluminum alloy pipe (Schedule 3612), pipe cutters (Schedule 3628), motor-driven internal cylinder grinding machine (Schedule 3626), lubricating pressure guns (Schedule 3595), for Eastern and Western yards.

THESE MAKE *Tough* JOBS MUCH SIMPLER

Lamson Pre-assembled Lock Washer screws are available in 8/32" to 5/16" diameters, and in lengths up to 1 1/2". Standard head styles are round head, binding head, oven head and hexagon head. Lamson & Sessions Company is a licensed manufacturer of this patented screw.



Dardelet Self-Locking Screw Threads may be applied to any type of bolt. Dardelet bolts are unaffected by vibration, loss of initial bolt tension or wear. They have higher tensile and impact strength, and greater endurance limit than standard threads.



The new Lamson Lock Nut keeps assemblies tight which are subject to severe vibration or shock. Locking crown grips bolt thread like a vise. One-piece design. Can be used repeatedly.

Lamson full finished Cap Screws of SAE 1020 steel have approximately 90,000 lbs. per sq. in. *minimum* tensile strength. Our high carbon cap screws of SAE 1035 steel, heat treated, have approximately 150,000 lbs. *minimum* tensile strength.

● One of these four products made separate stocks of lock washers and screws unnecessary, combined them into one stock bin for each size. *(That was the Lamson pre-assembled lock washer screw.)* Another of these products helped build a bridge faster and at a lower cost for joining steel members than by other and older methods. *(That was a Dardelet bolt.)* A third solved the problem of taking time out for tightening the nuts of pneumatic tools which came loose frequently from incessant vibration. *(That was a Lamson lock-nut.)* A fourth gave a truck manufacturer far more tensile strength than had been available before at the price. *(That was a Lamson 1035 heat treated cap screw.)* And there are other Lamson products, not shown here, which offer similar advantages to you for your assemblies. *Increase* your profits by *reducing* costs—ask Lamson how it may be done!

THE LAMSON & SESSIONS CO., Cleveland, Ohio

75th ANNIVERSARY 1865-1940

Your Jobber stocks the Lamson line

LAMSON & SESSIONS

BOLTS • • NUTS • • COTTERS • • CAP SCREWS • • SPECIALS

The South

• **Scripto Mfg. Co.,** 425 Houston Street, Atlanta, Ga., automatic lead pencils and other metal specialties, plans new three-story plant, 60 x 85 ft., with one-story building adjoining for storage and distribution. Cost over $60,000 with equipment. Walter McDonald, 140 Peachtree Street, N. E., is architect and engineer.

Nantahala Power & Light Co., Franklin, N. C., plans new hydroelectric power plant on Little Tennessee River, Swain and Graham Counties, N. C., comprising power dam 470 ft. high and 1750 ft. long, tunnels and penstocks, hydroelectric generating station with initial capacity of 300,000-hp., switchyard, power switching station, transmission lines and other facilities. Cost reported over $5,000,000. Application has been made for permission. Company is affiliated with Carolina Aluminum Co., Badin, N. C., which will use part of output.

West Virginia Traction & Equipment Co., 525 Elizabeth Street, Charleston, W. Va., mechanical equipment, has let general contract to H. B. Agsten & Son, 417 Washington Street East, for one-story plant on Patrick Street. Cost about $55,000 with equipment. Tucker & Silling, Masonic Temple Building, are architects.

Reynolds Metals Co., Richmond, Va., has let general contract to Daniel Construction Co., 691 South 19th Street, Birmingham, for aluminum plant at Sheffield, Ala. Cost with equipment estimated close to $23,500,000.

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, will carry out expansion and improvements in branch fabricating mill at Alcoa, Tenn., including several one-story production units, and storage and distributing buildings, extensions in power station equipment and other facilities. Cost reported over $750,000 with equipment.

Gulf Shipbuilding Corp., Chickasaw, Ala., plans modernization and expansion in plant, including new shipways, shops and other buildings, with installation of cranes, electric hoists and other mechanical-handling equipment, machine tools and other tools. Facilities will be used for construction of vessels for Navy Department, Washington, which has provided fund of $2,500,000 for project. Work will be carried out at once.

Standard Building Materials Co., 231 31st Street, South, Birmingham, plans rebuilding of portion of plant recently destroyed by fire. Loss over $50,000 with mechanical-handling, loading and other equipment.

Central States

• **Ohio Machine Tool Co.,** Kenton, Ohio, metal-working machinery and parts, has let general contract to Austin Co., Cleveland, for one-story addition, 50 x 100 ft., for expansion in assembling division. Cost about $50,000 with equipment.

Cuyahoga Foundry Co., 4530 East 71st Street, Cleveland, has approved plans for one-story foundry addition, for which general contract will be let soon, 80 x 115 ft. Cost close to $60,000 with equipment.

Frigidaire Division, General Motors Corp., 300 Taylor Street, Dayton, Ohio, will take bids soon on general contract for five-story addition, 150 x 230 ft., to be equipped for production of machine guns for Federal Government, including parts production and assembling. Also will build a two-story addition to present building. Cost over $1,000,000 with machinery. Schenck & Williams, Third National Bank Building, are architects.

Constructing Quartermaster, Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 30 for one-story storage and distributing building for signal corps, 121 x 252 ft.

Ridge Tool Co., Ridge Road, Elyria, Ohio, with plant at North Ridgeville, near Elyria, plans new plant fronting on Highway No. 20, where tract of about 30 acres of land has been secured. It will consist of a main one-story unit and several auxiliary buildings. Cost close to $100,000 with equipment.

Modine Mfg. Co., Factory Street, La Porte, Ind., automobile radiators, air-conditioning equipment, etc., plans one-story addition, 90 x 220 ft. Cost over $100,000 with equipment. C. M. Pearson, 1129 Diamond Avenue, South Bend, Ind., is engineer. Main offices of company are at Racine, Wis.

Stokely Brothers & Co., 941 North Meridian Street, Indianapolis, canned food products, plans rebuilding of branch plant at Martinsville, Ind., recently destroyed by fire, including processing, canning and other departments. Loss over $500,000 with equipment.

Stearman Aircraft Co., Wichita, Kan., affiliated with Boeing Aircraft Co., Marginal Way, Seattle, has let general contract to Austin Co., Cleveland, for further expansion in plant, where work is now in progress on several buildings; new units will be one-story, 200 x 1000 ft., and 100 x 100 ft., respectively. Cost over $1,000,000 with equipment.

Planters' Cotton Oil Co., East Fifth Avenue, Pine Bluff, Ark., plans rebuilding of portion of mill, including press room, separator and meal departments, recently destroyed by fire. Loss over $50,000 with equipment.

Missouri Bridge & Iron Co., Fullerton Building, St. Louis, is completing plans for new branch plant on LaPorte Highway, Pasadena district, Houston, Tex., where tract of 15 acres recently was acquired, and will begin work soon on several one-story units. Cost over $85,000 with equipment.

Coca-Cola Bottling Co., Ottawa, Kan., has let general contract to O. M. Staneart, Ottawa, for one-story mechanical-bottling, storage and distributing plant. Cost about $50,000 with equipment. Carl B. Cooper, Birmingham, and Clarence Washburn, Ottawa, are architects.

Eastern States Petroleum Co., Inc., First National Bank Building, Houston, Tex., plans new bulk oil storage and distributing plant on 20-acre tract on Houston ship channel, recently acquired, consisting of new wharf, group of buildings, steel tank storage units, pumping machinery and other facilities. Cost reported over $100,000 with equipment.

A. M. Westergard, Rockport, Tex., naval architect and engineer, has plans for new shipbuilding and repair plant on local waterfront site for company whose name is temporarily withheld, comprising shipway, machine and woodworking shops, metal-working and other shops, miscellaneous buildings and office. Work will begin soon. Cost about $200,000 with equipment.

Coca-Cola Bottling Co., Uvalde, Tex., has let general contract to M. H. Ryland, Uvalde, for new one-story mechanical-bottling, storage and distributing plant. Cost close to $50,000 with equipment. Jesse M. Shelton, Bona Allen Building, Atlanta, Ga., is architect.

Eureka Tool & Die Co., 3430 East Fort Street, Detroit, plans new one-story plant on Grinnell Avenue. Cost over $60,000 with equipment. Lyndon, Smith & Winn, Highland Park, Mich., are architects.

Chevrolet Motor Division, General Motors Corp., Detroit, has let general contract to O. W. Burke Co., Fisher Building, for two-story addition to branch plant at Flint, Mich., 132 x 330 ft., for expansion in service division. Cost over $350,000 with equipment. Albert Kahn Associated Architects & Engineers, Inc., New Center Building, Detroit, is architect and engineer.

Aeroquip Corp., Jackson, Mich., recently organized to manufacture a new patented hose coupling for aircraft and other service, and kindred products, has purchased former local plant of Reynolds Spring Co., East Avenue, formerly given over to bakelite products manufacture, and will improve and equip for plant. Donald T. McKone is president.

H. R. Krueger & Co., 1469 East Grand Boulevard, Detroit, boring machinery and parts, has begun work on one-story addition, for which general contract recently was let to F. H. Martin Construction Co., 955 East Jefferson Street. Cost close to $50,000 with equipment. Mildner & Eisen, Hammond Building, are architects.

Ingersoll Milling Machine Co., Douglas Street, Rockford, Ill., has let general contract to Security Building Co., 717 East Jefferson Street, for one-story addition, 85 x 90 ft. Cost over $45,000 with equipment.

Bastian-Blessing Co., 240 East Ontario Street, Chicago, has asked bids on general contract for new one-story plant, 400 x 450 ft., on 13-acre tract recently acquired at Peterson and Rogers Avenues. Cost over $450,000 with equipment. Fox & Fox, 549 West Randolph Street, are architects.

A. W. Cash Valve Mfg. Co., North Water Street, Decatur, Ill., plans one-story addition. Cost over $60,000 with equipment.

Coca-Cola Bottling Co. of Minnesota, Inc., 2035 University Avenue, S. E., Minneapolis, Minn., plans new two-story mechanical-bottling, storage and distributing plant on Central Avenue. Cost over $50,000 with equipment. Ernest H. Schmidt & Co., Coughlan Building, Mankato, Minn., are architects.

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago, has let general contract to Cunningham Brothers, 359 East Grand Avenue, Beloit, Wis., for one-story addition, 80 x 220 ft., to branch plant at Beloit, for foundry for production of brass, bronze and other nonferrous castings. Cost over $150,000 with equipment. O. D. Conover, 1740 East 12th Street, Cleveland, is architect and engineer.

City Council, Glidden, Iowa, asks bids until Nov. 4 for extensions and improvements in municipal power plant, including installation of new 350-bhp. diesel engine-generating unit, forced-draft cooling tower, and auxiliary equipment. A. S. Harrington, Baum Building, Omaha, Neb., is consulting engineer.

M. Schamberger Distributing Co., 3840 North Southport Avenue, Chicago, beer and ales, has let contract to Rune & Sons, 6760 Stony Island Avenue, for new one and two-story storage and distributing plant at 4743 West Kinzie Street. Cost close to $50,000 with equipment. Cedric A. Shantz, 25 East Jackson Boulevard, is architect.

Western States

• **Shell Oil Co. of California, Inc.,** 100 Bush Street, San Francisco, plans new bulk oil storage and distributing plant on river front at Sacramento, Cal., consisting of group of one-story buildings, machine shop, steel storage tanks, pumping station, dock and other facilities. Cost over $200,000 with equipment.

Northrop Aircraft, Inc., Hawthorne, Cal., has let contract to E. S. McKittrick Co., Inc., 5905 Pacific Avenue, Huntington Park, Cal., for steel framing for one-story additions, totaling close to 200,000 sq. ft. of floor space, for expansion in parts production and assembling departments. Cost about $1,000,000 with equipment.

Public Works Officer, naval destroyer base, San Diego, Cal., plans new graving drydock for cruisers, with shops and other facilities, including cranes, hoists, etc., to cost about $3,000,000. Also will make extensions in power plant and electrical distributing system, with installation of additional equipment, cost about $130,000; group of one-story buildings for storage and distributing service, cost about $500,000 with equipment; new one-story mechanical shops, cost $220,000 with equipment. Appropriations have been arranged in amounts noted. Work will begin soon.

Truscon Steel Co., 2139 North Kerby Street, Portland, has approved plans for one-story addition, 66 x 101 ft., for storage and distribution. Cost close to $40,000 with equipment.

Utility Fan Corp., 2528 Santa Fe Avenue, Los Angeles, mechanical fans and equipment, plans new one-story plant, about 25 x 100 ft., at 4851 South Alameda Street. Cost about $45,000 with equipment. Herbert A. Hamm is company engineer.

Consolidated Aircraft Corp., 3302 Pacific Highway, San Diego, Cal., has let general contract to Emil Brown & Co., 300 East Ninth Street, Los Angeles, for two one-story additions, 200 x 1500 ft., and 360 x 740 ft., respectively. Cost over $1,500,000 with machinery. Taylor & Taylor, 725 South Spring Street, Los Angeles, are consulting engineers.